

Beinn Bhreagh Recorder by Alexander Graham Bell, from July 24, 1909 to October 19, 1909

BEINN BHREAGH RECORDER

VOL. I

1909 JULY 24 – OCT. 19

Alexander Graham Bell

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THE BEINN BHREAGH RECORDER

VOL. I

1

INTRODUCTORY

Vol. 1

Beinn Bhreagh, July 23, 1909: — Now that Mr. F.W. Baldwin and Mr. Douglas McCurdy (the consulting Engineers of Beinn Bhreagh Laboratory) are at Petewawa, and likely to be absent from Beinn Bhreagh for an indefinite period, I cannot obtain their assistance in Laboratory matters unless we have some form of Bulletin to keep them in touch with Laboratory work.

At the same time, I am unwilling to fetter myself by undertaking regular issues of a Bulletin; and have therefore decided to start a record book which will be issued, a few pages at a time, as convenient to me: The book to be known as THE BEINN BHREAGH RECORDER. Vol. I will be commenced at once.

As in the case of the Bulletins of the Aerial Experiment Association I propose to have seven typewritten copies made at once; and distributed as decided upon.

There will be no regular issue of parts: Simply a few pages will be typewritten from time to time, the pages being numbered consecutively. These will be distributed to the heads of Departments upon Beinn Bhreagh Estate, including the Laboratory, and the Aerodrome Company. The pages as

received, will be filed in a portfolio; and, when a sufficient number of pages have been collected, they will be bound up in a volume for permanent preservation.

These volumes will remain my property. Prior to being bound they will be considered as simply loaned to the persons who receive them, for their information. After binding, a different distribution of the volumes will be made with the object of securing their permanent preservation in places accessible to persons interested.

Only seven copies in all will be issued; and these will be specifically designated as copies A,B,C,D,E,F,G and H.

Each page will bear, at the top, the date at which it had been typewritten; and this may be taken as the date of issue of that particular page, although, as a matter of fact, it may not have been sent to Heads of Departments until subsequently.

I do not propose to limit myself to a record of Laboratory work; but intend to include events and occurrences on Beinn Bhreagh Estate, and items of interest to the people of the Estate: Also, to include thoughts and discussions on various subjects, as well as the results of experiments.

In fact this private publication will aim to be, as its name implies, "The Beinn Bhreagh Recorder".

Alexander Graham Bell. Editor.

3

EVENTS ON BEINN BHREAGH July 1-22, 1909

The Return of Dr. and Mrs. Bell

July 1:— Dr. and Mrs. A.G. Bell, accompanied by Miss Christine McLennan, returned from Europe reaching Beinn Bhreagh Thursday, July 1.

Aerodrome Park fo R Baddeck

July 6:— A.G. Bell, Douglas McCurdy, and Wm. F. Bedwin inspected, from the motor boat Gauldrie, the flat meadow land bordering the Lake beyond Baddeck on the other side of Kidston's Island, with the object of determining whether it could be used as a practice ground for trying out aerodromes.

They came to the conclusion that there was ample room for trial flights there; and that it would be advisable to make arrangements with the owners of the land for its use as an aerodrome Park for Baddeck.

A Birth at Beinn Bhreagh Hall

July 9: —A son was born to Mr. and Mrs. Gilbert H. Grosvenor at Beinn Bhreagh Hall, Friday, July 9, 1909 at about 3 p.m.

Dr. McDonald of Baddeck was in attendance; with Miss Thompson, a trained nurse from Washington, D.C.

The child has since been named Alexander Graham Bell Grosvenor. He will be called "Alec" for short, in order 4 to distinguish him from his cousin, Alexander Graham Bell Fairchild, who is known as "Sandie".

Alec Grosvenor is the first child born at Beinn Bhreagh Hall.

Baddeck Citizens visit Aerodrome Factory .

July 9: — At the invitation of the Canadian Aerodrome Company a large number of persons came over from Baddeck and visited the Aerodrome Factory.

Mr. Douglas McCurdy presided upon the occasion, and exhibited the new aerodrome that has just been completed by the Company— the first built by them.

He stated that this was the first aerodrome of exclusively Canadian manufacture; and that it had been made entirely by Baddeck men. For this reason the Company had given the people of Baddeck the opportunity of seeing it before its departure for Petewawa, where it will be fitted with an engine. To mark the place of its origin the machine will be officially known as the aerodrome "Baddeck No.1".

After the exhibition the visitors adjourned to Mrs. Baldwin's Bungalow, where afternoon tea was presided over by Mrs. Frost, sister of Mr. Douglas McCurdy, and by Miss Georgina McCurdy.

Water Supply for Baddeck .

July 12: — Hon. A.C. Ross visited Beinn Bhreagh to consult with Mrs. Bell about the use of her property at Crowdis Mountain as a source of Water Supply for Baddeck.

The following is a copy of the correspondence between Mrs. Bell and Mr. Ross concerning the matter which culminated 5 (July 12) in an arrangement satisfactory to both:—

Mrs. Bell to Ross.

July 3, 1909:— Mr. Bell has told me of your conversation with him on board the Steamer Blue Hill about your new project for bringing water into the town of Baddeck from my Crowdis Mountain property. It is no longer proposed, I understand, that the town itself should undertake the work; but that a Water Company should be organized for the purpose.

When the proposition was first brought publicly to the attention of the people of Baddeck that the town itself should bring in this water, I offered, in the event of the plan being adopted, to present my Crowdis Mountain property to the town as a free gift for the benefit of the people; but the offer was not accepted. I may say that I am no longer willing to repeat this offer either to the town, or to a Water Company.

I had supposed that the whole plan for utilizing this source of water supply had been abandoned; and I have therefore been forming other plans for the utilization of the water power in a commercial way.

I shall be glad, however, to hold these plans in obedience until I know more definitely what your plans may be.

I would, of course, be glad to co-operate in any movement to bring water to the people of Baddeck; and I shall be willing to consider, in a liberal spirit, any proposition from your proposed Company looking to the utilization of my Crowdis Mountain property for this purpose.

(Signed) Mabel G. Bell.

Ross to Mrs. Bell .

July 7, 1909: — In reply to your favor of July 3 rd. I beg to say:

Dr. Bell, in writing me last year in connection with the above, intimated that he thought, in the event of the town of Baddeck not availing themselves of your very generous offer to make them a gift of your Crowdis Mountain property providing that the people of the town established a water system for the town, you would consider favorably conveying this property to me at a nominal sum if I undertook the formation of a Company to supply the town of Baddeck with a water system for domestic and fire purposes.

The town (as you are aware) declined to undertake the installation of a gravitation water system of their own, but expended some money in trying to get a supply by borings in rear of the town, which proved a failure. The water committee then requested me to organize a Company to supply the town with a good water system.

With this end in view I have been getting data as to cost and possible revenue.

My son, George (who is an Engineer) is now making a preliminary survey, and I hope to be able on Monday next to submit some plans and figures re this proposal for the consideration of yourself and Dr. Bell, with a view of securing your co-operation in supplying the people of Baddeck with a much needed good water system.

(Signed) A.C. Rose.

Ross to Mrs. Bell .

July 12, 1909:— THE CROWDIS MOUNTAIN PROPERTY. I beg to make you the following proposition on behalf of the Water Company which I am organizing to supply the town of Baddeck with water for domestic and other purposes.

If you will convey the above property, including the water source and falls, to a Company to be known and incorporated as "The Baddeck Water Company" , I will undertake, for the Company, to deliver to you 20% of the stock of proposed Company fully paid and unaccessable, and any amount

of first mortgage bonds of the Company at \$95.00 on the hundred. These bonds to bear interest at 5%, and be for a term of twenty years.

The Company will further undertake to preserve the forests on the said property.

They will also erect a suitable public drinking fountain at their own expense, at any place in the town that you may indicate, and connect the said fountain with the proposed water system.

(Signed) A.C. Ross.

Mrs. Bell to Ross .

July 12, 1909: — I beg to accept the proposition contained in your letter of even date, with these modifications:—

1. That the consideration of 20% of the stock of the Company in fully paid up and unaccessible shares, together with the right to subscribe for any amount of first mortgage bonds of the Company at \$97.00 the hundred, proposed to be given me, shall instead be assigned to the town of Baddeck, as I do not wish to even appear to make money out of its necessities.

7

A long flight by 2. That the Forests A Long Flight by Curtiss. shall not merely be kept uninjured, but that a good road be maintained, and the public allowed free access to the mountain as a public park, under suitable restrictions for the safety of the Company's property.

3. That these conditions, of a free public fountain, and the maintainance of the forests be made binding upon the Company and its successors for over. Failure to comply with which shall entail forfeiture of the property to me or my heirs-at-law.

(Signed) Mabel G. Bell.

Mr. Ross stated that this would be satisfactory to him, and that he would have legal papers drawn up to have the property transferred to the Company in accordance with Mrs. Bell's plans.

Arrival of Mrs. Fairchild and Family

July 16: — Mrs. David G. Fairchild arrived at Beinn Bhreagh (July 16) accompanied by her son Alexander Graham Bell Fairchild (Sandie) and her daughter Barbara Lathrop Fairchild (a baby in arms). Also accompanied by Miss (a trained nurse from Washington, D.C.) and by her maid Anna Urquhart of Nova Scotia.

Along flight by

A Long Flight by Curtiss .

July 16:— A telegram was received from Mr. Glenn H. Curtiss announcing a long flight in his new aerodrome:—

Curtiss to Bell .

Mineola, July 16: — First long flight this morning. Fifteen miles. Everything fine.

(Signed) G.H. Curtiss.

Bell to Curtiss .

Baddeck, July 16: — Heartiest congratulations from all. Hope this means the 8 Scientific American Trophy for you r Baldwin and Mc Curdy will soon try to rival your achievement in their new aerodrome "Bad deck No.1" which has been sent to Petewawa.

(Signed) Graham Bell.

McCurdy leaves for Petewawa .

July 21: — Mr. J.A. Douglas McCurdy left Beinn Bhreagh for Petewawa, Wednesday morning, July 21.

Arrival of Students from Princeton University

July 21: — A party of students from Princeton University arrived at Beinn Bhreagh on Wednesday afternoon (July 21) in the Yawl "A.J. McCosh" (the name of a former president of Princeton University). This fine yacht has been presented by the students of Princeton University to Dr. Grenfell of Labrador to be used by him in his work there; and it is being taken to Labrador by a party of students.

There are seven persons on board (probably not all students). Five of them, all Princeton students, took dinner at Beinn Bhreagh. Their names, as recorded in Mrs. Bell's Visitors' List are as follow:—

Paul G. Tomlinson, of Elisabeth, N.J.

Ethan Flagg Butler, of Washington, D.C.

H.P. Townsend, of Washington, D.C.

Andre L. Causse, Jr., of Raleigh, N.C.

Hugh K. Gilmore, of Washington, D.C.

July 22: — The Princeton students visited the Tetrahedral Tower on the top of the mountain early in the morning accompanied by their dog, a Gordon setter, named "Lady".

The dog followed them up the steps to the very top of the Tower, but required a little assistance in coming down again.

In the afternoon the students visited Beinn Bhreagh Laboratory where they were received by Mr. Bedwin, Superintendent, who explained the work going on there. They also visited the Aerodrome Factory of the Canadian Aerodrome Company where Mr. Ingraham took charge of them and explained the work of the Company.

In the evening the students visited Beinn Bhreagh Hall for a game of billiards.

EXPERIMENTS AT BEINN BHREAGH . July 1-22, 1909.

July 22: — The following is a partial list of experiments made at Beinn Bhreagh between July 1 and July 22, 1909. The details concerning these and other experiments are contained in Dr. Bell's private note book, and no necessity exists for burdening the pages of the Recorder with un-necessary

details. The results obtained in those and other experiments will be reported upon from time to time in the Beinn Bhreagh Recorder.

1. Condensing water from the breath:— Experiments made at the Houseboat July 3.
2. Practice flight with model of Cygnet II, on Baddeck Bay, July 6.
3. White Oionos kite flown upside down, on the kite field, July 10.
4. Condensing water from the breath: Experiments continued at the Houseboat, July 11.
5. White Oionos kite flown upside down: Experiments continued on the kite field, July 12.
6. Practice flight with model of Cygnet II, on Baddeck Bay, July 12.
7. White Oionos kite flown upside down, and towed by the Gauldrie on Baddeck Bay, July 13.

10

8. Double Oionos kite of Red silk flown and towed by Mr. Bedwin's motor boat "Sw?rm", on Baddeck Bay, July 20.
9. Sanitary disposal of Sewage matter:— Experiments at the Crematory July 20.

DISCUSSION CONCERNING AERODROMES

(Reported by Miss Mabel B. McCurdy, Stenographer, and Secretary of Beinn Bhreagh Laboratory)

July 8, 1909: — The following contains the substance of a discussion between Messrs. Bell, McCurdy and Bedwin July 8, concerning aerodromes. M.B. McC.

Mr. Bell:— I don't think it safe to make an aerodrome that won't fly as a kite. I mean the model of which won't fly as a kite.

Mr. McCurdy: — Bet you a dollar the Silver Dart won't fly as a kite; and yet she is safe enough as an aerodrome.

Mr. Bell:— That's just where I differ from you. I don't think her safe. Her equilibrium depends upon the skill of the aviator and not upon the machine; and that is my objection to all the aerodromes of that type, or of similar type like the Wright Brothers' machine.

Mr. Bedwin: —What about the monoplanes then?

Bell: —I have the same objection to the monoplanes.

Bedwin: — Don't you think the Silver Dart would fly as a kite with a tail behind her?

Bell: —Not a bit of it. The tail would certainly improve its longitudinal stability, but it lacks lateral stability. Once tipped a little on one side it would tend 11 1909, July 26, to slide down hill sideways towards the ground.

Bedwin: — Wouldn't a vertical surface cure that?

Bell: — Vertical surfaces would certainly prevent her from sliding down as quickly to one side as if they were omitted altogether; but put one tail and vertical surfaces and she is no longer the “Silver-Dart”.

The changes that have improved the efficiency and quickness of handling have by no means improved the inherent stability of the machine. I mean, the emission of a fixed horizontal tail renders it more unstable in the fore and aft direction, and the emission of vertical surfaces has removed a safe-guard against lateral instability. The stability of the machine as a whole now depends almost exclusively upon the skill of the operator.

An Oionos kite, if not loaded in the middle sometimes turns over on its side, but it has no tendency to dive down sideways as a kite of the “Silver-Dart” pattern would do. An unleaded Oionos kite, when tipped over from some cause or other, actually continues flying on its side until the disturbing causes have disappeared when it gradually rights itself again. This may be due to the large amount of resolved vertical surface. At all events I consider the Oionos a safer form than the Hammondsport type of machine.

Kites of pure tetrahedral construction come out in such a marked contrast to all other forms I know of as possessing good lateral stability, that I consider it very important that we should study the conditions required to give such a kite efficient engine power. This should constitute one of the main problems before the Laboratory this summer.

The Oionos form seems to me, although imperfect in stability, to be superior in that respect to the Hammondsport type of structure, and to give promise of greater lifting power with less head resistance.

It would be advisable I think to use lateral rudders at least at first, to make sure of lateral stability; and a fixed horizontal tail to secure equilibrium in the fore and aft direction. Later when the aviator gains experience the tail could be omitted if deemed desirable in the interest of speed.

McCurdy: — With a double surface machine without any verticals, what is going to cause it to upset laterally as a pure flying-machine not as a kite.

Bell: — A hundred things. For example, a squall of wind on one side may cause it to tip slightly from the horizontal position; and when tipped, from whatever cause, gravity tends to make it slide down hill sideways.

McCurdy: — But it would also tend to right it, because the center of pressure that may would cause it to advance towards the down end.

Bell: — Not gravity, but the horizontal component of its motion. Gravity simply tends to bring it down; but when in falling, it has acquired horizontal as well as vertical motion, the horizontal component of its motion leads to a lateral displacement of the center of pressure. Then it would commence to rise up again. The whole machine would thus tend to fall with an oscillating motion, swaying now to one side and then to the other, a dangerous condition.

We are talking here, of course, of the lateral automatic motions. When we use lateral rudders then the skill of the aviator comes into play to neutralize the dangerous tendencies.

My objection to the type of machine arises from the fact that safety depends so exclusively upon skill. Witness what happened to a Wright machine the other day when the Italian aviator lost consciousness.

McCurdy: — It is impossible when a machine is flown as a kite to subject it to the side action of a wind, because necessarily the kite flies in the eye of the wind so we don't know how that would act; whereas in a free machine the conditions are different.

Bell: — The kite is subjected also to side gusts from squalls, but as McCurdy remarked it is not subjected to the side action of a continuous wind. Sudden gusts however, are the chief disturbing elements. I think a free flying-machine would be more stable than a kite in gusts, because it

possesses momentum, whereas the momentum of a kite is nil . At least it has momentum relatively to the earth.

Bedwin: — The momentum of a kite is relative to the wind to the same extent that the momentum of a free flying-machine is relative to the wind I should think.

14

Bell: — It may be so; but I have a suspicion that it is not.

McCurdy: — I don't think it is. I think that the velocity of a flying-machine is always along the line of its adavacne; whereas in the case of a kite its velocity at one instant is in a certain direction, and if a squall comes from another direction, the direction of its velocity relatively to the air is changed.

Bedwin: — I was speaking of steady wind.

McCurdy: —It is like taking "Cygnets" and flying it from one end.

Bell: —The momentum of a heavy body moving, say with a velocity of 20 miles an hour in very different from the momentum of a lighter body, say the wind, moving at the same velocity.

Bedwin: — The pressure on the surfaces would be the same would it not?

Bell: — Yes it would, the pressure on the surfaces would be the same. I am extremely doubtful however whether the pressure on the surfaces is the only source of support in a free flying-machine, and as inclined to think that the momentum of the machine is itself a source of support.

It is gravity that is the great obstacle to flight, and the constant of acceleration of gravity is only 32 ft. per second, or 21.6 miles per hour. I imagine that a flying machine whose velocity exceeds the constant of acceleration of gravity has, in its surplus velocity and momentum, a source of support against gravity quite independently of the 15 the aerial pressure.

If you can get a speed of 40 miles an hour as you do with the "Silver-Dart", almost anything would fly — Mr. Bedwin says a barn door for instance. The supporting surfaces in such a case become sources of retardation if the machine can be supported in the air at a lower velocity, and the thing would fly better without them, or at all events with less surface. A stone flies very well without supporting surfaces at all when it has sufficient velocity.

McCurdy: — It is always coming down though. Gravity always acts at right angles to your push.

Bell: —I don't think it is always coming down. Suppose you fire a bullet up at an angle with the horizon, the vertical element of its motion is directly opposed to gravity, and the bullet is not, as a matter of fact, falling in respect to the earth until its upward tendency to motion is less than the downward tendency due to gravity.

One would naturally suppose that the body of a crow would bob up and down with each motion of its wings, but the propelling force seems to be applied upwards at an angle, and we can easily see how the body may be actually pursuing a strictly horizontal path, as it seems to be doing in actual flight, as a resultant of the upward and downward tendencies. The wings push upwards say at a forward angle. The downward pull of gravity neutralizes the vertical upward component of the wing-push, leaving the horizontal component alone as a resultant.

16

It seems to me we are getting into deep water, and off our subject, in indeed we had any subject to start with.

McCurdy: —I would like to make a suggestion. That is that we know practically what weight we want to support, and we know practically what velocities we can get, hence we know about how much material we want, how much cloth etc., and if we don't de ?? ci de now the exact design of the structure we want etc., we can at all events get the materials right away. It takes a long time to get them, and they should be ordered now.

MB . It was finally agreed that Mr. Bedwin should order at once sufficient of fish-shaped strut material, and sail cloth like that on the "Baddeck No.1", to complete the proposed aerodrome of the Oionos type without waiting for the completion of the plans. This aerodrome will be designed to lift the "Query" out of the water, or to lift a truck with wheels, as may be preferred.

Mr. Bedwin has also been requested to build a half-sized model of the proposed aerodrome, so that its flying qualities as a kite may be tested by experiment.

M.B. McC.

17

SOME OBJECTIONS TO THE USE OF A VERTICAL RUDDER: By A.G.Bell.

July 1?, 1909: — In all or nearly all the flying-machines so far produced a rudder for horizontal steering appears at the rear forming a vertical tail. I see one or two objections to this arrangement, and means for overcoming them.

1. A side gust, or side wind, acting upon the vertical tail (which is far removed from the center of the machine), tends to turn the machine around a vertical axis so as to make it face the wind. This is a weather-cock sort of action in which the vertical rudder takes the place of the weather-vane. We know that a spanker sail upon a yacht tends to make the boat head into the wind, and we have a rudder-spanker on our aerodrome.

The remedy seems to have been found by the Wright Brothers, but has not been adopted in the "Silver-Dart" or "Baddeck No.1". The Wright Brothers place a vertical surface away out in front at the front control, and I can readily see that this arrangement meets the objection by providing a balancing vertical surface in front, so that the machine may be likened to a weather-cock with two vertical vanes one at either end, each neutralizing the others turning action under disturbing gusts or quartering winds. I think we should consider the advisability of adopting this arrangement in our new aerodrome.

2. There is however another objection to the use of a vertical rudder which this remedy does not meet.

18

Suppose we wish to steer to starboard, and put the helm in the proper position. Let the machine turn in a wide curve and completely reverse its path. Then the center of the machine, and every portion of the machine for that matter has described a semi-circle in the air.

Now the semi-circle described by a point on the starboard wing is necessarily of smaller diameter than the semi-circle described by the corresponding point on the port wing, and both paths have been traversed in the same time. Hence the velocity of translation of the starboard wing is less than that of the port wing while making the turn; and the supporting power of the starboard wing during the turn is therefore less than that of the port wing.

It from this that in turning to starboard the machine tends to tip down on the starboard side while making the turn, because that side receives less support from the air than the other side.

Now, so long as the machine remains horizontal the vertical rudder at the rear is vertical; but when the machine tips down on the starboard side while making the turn, the rudder at the rear is no

longer vertical but is tilted obliquely to starboard. There is then a vertical component in its steering action: It steers downwards as well as to one side.

This diving tendency, induced during a turn, seems to me to be one of the principal causes involved in making the manipulation of a machine difficult during a turn. At the very moment when the starboard wing loses some of its supporting power the head of the machine is steered downwards inducing a dive which can only be obviated by the manipulation of the other controls to preserve the equilibrium.

This sort of action, so far as I see, is inherent in a vertical rudder, and the remedy therefore necessitates, or at least renders advisable, the omission of the vertical rudder, and the substitution of some other form of device for horizontal steering. In this connection it is rather remarkable that nature makes no use of a normally vertical rudder: Our rudders work after the manner of a ship's helm, not a bird's tail, or wings.

What is wanted is something that will produce a turn without inducing a dive; and something that will give temporarily increased support to the wing making the shorter turn. Could we not obtain both kinds of action from our lateral rudders alone without any vertical tail, by making them separately moveable.

Suppose, for example, that we set the starboard lateral rudder at a positive angle to the line of advance, and leave the port rudder in its normal horizontal position. Then the resistance introduced on the starboard side will cause the machine to turn to starboard. The starboard wing then moving with less velocity than the port wing will lose some of its supporting power and would tend to tip downwards; but the lateral rudder being tipped at a supporting angle tends to neutralize this action by giving the wing additional support while making the turn.

I think also there would be no diving tendency.

20

1. If the lateral rudder should be placed behind the end of the wing-piece then it would act like a depressed horizontal tail, and tend to steer the head down, inducing a dive.
2. If it should be placed in front of the end of the wing-piece, then it would act as an elevated front control, steering the head up.
3. Between these two positions there is a neutral position where the axis of the rudder would come in the same line with the center of pressure of the main surfaces, which indeed is about the position I think occupied by the lateral rudders of the "Silver-Dart" and the "Baddeck No.1". In this neutral

position the vertical steering action should be nil, neither inducing a dive nor a climb. In such a position we would have only horizontal steering to the right, and increased support for the wing making the shorter turn.

I am inclined to think that if the lateral rudders on our present machines could be made separately moveable, we could do away altogether with the vertical rudder at the rear, and would then have nothing behind or around the propeller that could possibly foul the propeller and cause an accident.

It might be well to consider the advisability of letting the center of rotation of the lateral rudders be brought so far forward that any vertical steering action induced by its use should be in the nature of a climb rather than a dive, as the wing making the shorter turn needs additional support, not less, during the turn. A.G.B.

21

OBTAINING POWER FROM THE SUN'S RAYS:— Thoughts Concerning a Solar Motor: by A.G. Bell.

1909, July 2: — I have been recalling to mind the remarkable effects produced by radiophonic receivers containing lamp-black, soot, or carbon in a fine state of subdivision; and the possibility of applying the results to a motor worked by the sun's rays.

If we put into an empty bottle a few spoonfuls of dry soot, and concentrate a beam of sunlight upon the soot by means of a lens, the following effects are observed:—

The moment the focus falls upon the soot a gushing sound is heard from the bottle, if it has a narrow neck; and if a lighted candle be held near the mouth of the bottle the flame is blown away, showing that the heating of the soot has heated the air in the bottle causing some of it to be expelled suddenly.

If we hold the hand in the path of the beam of light, then the moment the shadow falls upon the soot, a sucking sound is heard from the bottle, and the flame of the candle shows an indraft.

These effects occur so suddenly that when the beam of light is rendered intermittent, by passing it through holes in the edge of a rapidly rotating disc of opaque material, distinct noises are perceived every time the light is let on, and every time it is cut off. By increasing the rotation of the disc we obtain a musical tone from the bottle which rises in pitch as the rate of interruption is increased. Clear musical tones are perceived even when the interruptions occur more than 100 times per

second; showing, that even at this paid rate, alternate expansion and contraction of the air within the bottle takes place in accordance with the interruptions of the light.

The thought had often occurred that it might be well to enquire what power could be produced by the alternate expansion and contraction of confined air in this way. I propose therefore to construct a simple apparatus to investigate this point, modelled upon one of my radiophonic receivers.

A shallow circle space is to be turned out of a block of brass. In this space will be placed a sheet of wire gauze coated with lamp-black; and the whole interior of the brass recess will also be smoked.

Then a diaphragm of glass will be arranged to cover the shallow recess like a telephone diaphragm. A cover will then be screwed on as in the case of the telephone, so as to hermetically seal the space.

If the air within the space is heated it will cause the glass diaphragm to bulge out to a certain extent, and with a certain force. To what extent, and with what force?

In order to determine this point the apparatus will be placed with the glass diaphragm horizontal, and above. A lever of brass will then be attached at one end to the edge of the cover, the other end projecting several centimeters beyond the opposite edge of the cover; and a projection upon the lever will rest upon the center of the glass diaphragm; and the free end of the lever will be loaded with a weight.

The movement of the glass diaphragm will be magnified by the free end of the lever; and the weight lifted by it will be a measure of the weight that could be lifted by the diaphragm.

In operating the apparatus a beam of sunlight will be concentrated upon the lamp-blackened wire gauze. The air in contact with it will then become heated, and cause the expansion of the air within the cavity.

From the action of this apparatus we may be able to determine whether any useful power could be generated in this way.

One difficulty in this connection is that glass is rather opaque to the invisible dark rays of radiant heat, so that in our apparatus we would be utilizing chiefly the heating effect of the luminous rays. The dark heat rays being largely absorbed by the lens, and the diaphragm; and doubly absorbed by any ordinary mirror we might employ to reflect the sun's rays upon the lens. In an ordinary glass mirror with a reflecting surface of mercury at the back the light has to pass twice through the thickness of the glass; once on its way to the mercury backing, and a second time after reflection

from that surface. Consequently great absorption takes place of the very rays that would be most effective for our purpose — the invisible dark rays of heat.

If we substitute for the glass diaphragm a diaphragm of ebonite, or hard rubber; and for the lens and mirror, a silvered concave reflector with the reflecting surface outside, we produce no marked absorption of the dark heat rays.

While hard rubber in thin sheets is remarkably transparent to the dark rays of heat, we might here lose the heating effect of the luminous rays, for hard rubber is opaque to light, excepting to the extreme luminous rays at the red end of the spectrum.

Perhaps a sheet of mica might be better than glass and better than hard rubber, for it is transparent to both sorts of rays. It is at all events transparent to light and it allows the transmission of the dark rays of heat to a much greater degree than glass. A glass fire-screen cuts off the heat of an open fire; but the mica window of a stove allows the heat to pass. A.G.B.

25

1909, July 30 BEINN BHREAGH ITEMS July 23–30

July 23: — Mr. John McDarmid arrived at Beinn Bhreagh from Halifax with a Shetland Pony which Mrs. Bell purchased in London, England. The Pony arrived by the Steamer Shanandeah.

The Princeton students visited South Cut, St. Anna in the Beinn Bhreagh buckboard.

July 24: — Mrs. Bell, Mrs. Fairchild, Miss Mabel B. McCurdy, Mr. Grosvenor and the Princeton students attended a party at the McCurdy Homestead given by Miss Georgina McCurdy and Mrs. Frost.

July 25: — Dr. W.W. Richardson of Morrisville, Pa. visited Beinn Bhreagh accompanied by his wife and little girl. They left the same day for Whycocomagh. Dr. Richardson is a son of the late Dr. Richardson, Superintendent of St. Elizabeth's Asylum, Washington, D.C.

July 26: — The yacht "J.A. McCosh" with the Princeton students on board left Beinn Bhreagh for Labrador this morning.

Mr. and Mrs. Albert Swalen Hasseler, of 3785 Walnut St., Philadelphia, paid a visit to Beinn Bhreagh July 26 and left for Whycocomagh. They are the parents of the young deaf photographer who made

such a fine photograph of the late Lieut. Solfridge. An enlargement of this photograph is in the Aerodrome Factory.

July 26:— A Challenge: —Beinn Bhreagh Laboratory, through the columns of the Recorder wishes to challenge any 26 team on the Estate to a game of Queits. The best two games in three to win. Wm. F. Redwin, Superintendent.

Beinn Bhreagh beats Baddeck: — Much interest was taken last winter in the old Scotch National game of Curling. The following were the Beinn Bhreagh players:— Baldwin, McCurdy, Bedwin, McFarlane, Mach an Ross, and Rudderhum (Skipper). The Cup donated by Mr. P.W. Baldwin for the greatest number of points in the Season, was won by the Beinn Bhreagh team against Baddeck. W. F. B.

Mr. Davidson, Superintendent of Beinn Bhreagh Nursery, is placing the following advertisement in the Baddeck and Sydney newspapers:—

Notice to Owners of Sheep .

At this season of the year when selling lambs why not get the highest price for them. Examine and see if you have any having six or more nipples. I will buy all sheep having six or more nipples; and will pay, delivered at Beinn Bhreagh Nursery \$10.00 for six, \$15.00 for seven, and \$20.00 for eight nipped. We have them now and you may also.

(Signed) John G. Davidson, Supt.

Arrival of Dr. Grenfell.

July 27: — Dr. Grenfell, of Labrador, arrived at Beinn Bhreagh this forenoon; and became the guest of Dr. and Mrs. Bell at Beinn Bhreagh Hall. About noon Dr. Grenfell visited Beinn Bhreagh Nursery and was received by Mr. Davidson, Superintendent who explained the work of the Nursery. He assisted Dr. Bell and Mr. Davidson in making an examination of the 6n, 7n, and 8n lambs born this year. In the afternoon Dr. Grenfell visited Beinn Bhreagh Laboratory and was received by Mr. Bedwin, Superintendent, who explained to him the work 27 of the Laboratory. He also visited the Headquarters of the Canadian Aerodrome Company where he was received by Mr. Ingraham who showed him what was being done in the Aerodrome Factory.

Beinn Bhreagh was startled today (July 27) by the arrival of two automobiles on the estate. These are the first automobiles that have ever appeared here so far as known. From a newspaper clipping it appears that these automobiles arrived at Baddeck July 26 from Sydney. The occupants were Mr. and Mrs. Jake Hall, Mr. F.C. Besanson and two friends from Sydney.

Mr. and Mrs. Frost and Miss Georgina McCurdy visited Beinn Bhreagh Hall this evening (July 27) and met Dr. Grenfell. Mr. and Mrs. Frost were married at Beinn Bhreagh Hall about four years ago, and our celebrated kite "The Frost King" was named in their honor. This is the first visit that Mr. Frost has paid to Beinn Bhreagh Hall since his wedding.

Hospital Sledge for Dr. Grenfell .

Dr. Grenfell, during the course of his visit to the Laboratory today (July 27) was much interested in seeing the ice-boat we used last winter for testing out aerial propellers; and questioned Mr. Bedwin as to the speed made on Baddeck Bay. When Mr. Bedwin reported the maximum speed attained as between 50 and 60 miles an hour Dr. Grenfell suggested that an aerially propelled hospital sledge would be of great assistance to him in his work in Labrador. He sometimes has to go 60 or 70 miles, generally over smooth and level snow with a good crust upon it; and it takes him 28 two or three days or more to make the journey with a dog team. The length of time occupied is of importance as these journies are generally undertaken in emergency cases to relieve sickness or injury occurring in isolated places far removed from medical or surgical aid, and time is of the greatest importance. He thinks that as ambulance sledge, propelled by an aerial propeller, would probably reduce the time required to two or three hours instead of two or three days.

Beinn Bhreagh Laboratory has under contemplation the construction of such a sledge as Dr. Grenfell desires to be fitted with a gasoline motor and an aerial propeller. Dr. Grenfell will supply Mr. Bedwin with drawings and a description of the kind of sledge now used with a dog team.

July 28: — A large number of visitors from Baddock and vicinity visited Beinn Bhreagh Hall Wednesday afternoon, July 28 to meet Dr. Grenfell. Dr. Grenfell gave an interesting address concerning his work in Labrador.

A meeting of all the Laboratory Staff was held in the Superintendent's office Wednesday afternoon, July 28, to receive the first issue of the Beinn Bhreagh Recorder. Dr. Bell explained the object of the Recorder and requested the co-operation of the Laboratory Staff. Dr. Bell and Mr. Bedwin took turns in reading articles from the Recorder and items of interest to people on Beinn Bhreagh.

In looking at this gathering of men actively employed in promoting progress in the art of aviation the thought occurred. Why not continue these meetings, say once a week, and invite discussion. An Aero Club for Beinn Bhreagh.

29

Departure of Mrs. Fairchild .

July 29: —

Mrs. Fairchild left Beinn Bhreagh this morning for Quebec, where her husband will join her. They sail by Steamer "Dominion" for a short visit to Great Britain.

A Dangerous Insect at Beinn Bhreagh .

Miss Mabel B. McCurdy returned to Beinn Bhreagh today (July 29) after a few days absence on account of a sting from a mysterious insect which she thinks was a bumble bee, but which Dr. McDonald asserts could not have been.

The great swelling and inflammation produced suggested infection of some sort; and Dr. Grenfell was of the opinion that the coloring matter of the stocking might have poisoned the puncture.

The accident occurred near the Laboratory, July 23; and, after the lapse of a week, Miss McCurdy is still suffering and is obliged to go on crutches.

The thought is rather disconcerting that we may have dangerous insects on Beinn Bhreagh, more especially so when we consider the number of little children running about there barefooted and barelegged.

, Accident: to Jim McKenzie's Son.

Mr. Jim McKenzie was called to Baddock to-day (July 29) to meet his wife and son who had arrived suddenly from their home in North River Center, St. Ann's, for surgical aid to the boy, who was suffering from the effects of having stepped upon a rusty nail. Dr. McDonald operated upon the boy (John Allan McKenzie), and anticipates no serious consequences.

Mrs. McKenzie and her son passed the night at Beinn

30

Arrival of the Enchantress .

A fine steam yacht, believed to be "The Enchantress", arrived at Beinn Bhreagh to-day (July 29) from New York, to take Dr. Grenfell to Labrador. The owner, Mr. Macready and his wife, were on board.

Mr. and Mrs. Macready and Dr. Grenfell, accompanied by Mrs. Bell, drove down to the Laboratory and Aerodrome Factory by the High level road, calling on the way at the tent which Mr. Grosvenor has set up in the woods at Helville Glen as an office. Here, assisted by Mr. Cox as typewriter, Mr. Grosvenor pursues his editorial work for the National Geographic magazine, a monthly publication, issued at Washington, D.C., and forming the official organ of the National Geographic Society.

Accident to Mrs. Bell .

In coming from the tent, over the rough ground, Mrs. Bell twisted the ankle she sprained during her recent trip to England and which crippled her there for quite a long time. We hope she may not suffer in the same way as the result of the present accident.

Departure of Dr. Grenfell

Mr. and Mrs. Macready dined at Beinn Bhreagh Hall, and after dinner Dr. Grenfell said good bye to Beinn Bhreagh and went on board the yacht (July 29). The yacht is expected to sail early in the morning of July 30 for Labrador.

31

Excursion to Little Harrows .

The Steamer Blue Hill called at the Central Wharf this evening (July 29) for the Beinn Bhreagh people who desired to join the excursion to the Little Harrows in aid of the Victorian Order of Nurses at Baddock.

The following is a list of the Beinn Bhreagh passengers so far as can be obtained:— Miss Thompson and Miss Macrae (trained nurses from Washington, D.C.), Maggie Campbell, Sarah McDonald, Annie McDonald, John McIver, James Stanton, Edward Dart, Frank May, Dan McIver, Andrew Bingay, Neil McDermid, Mrs. Byrnes, Mrs. Rudderham, Miss Collins, Edith Rudderham, Mr. and Mrs. Ingraham, John M. McNeil, John Maclean, Archie Smith, Murdoch McDonald, Tom Roberts, Theresa Callaghan, Margaret Maclean, and Christine MacLennan.

July 30:— The steam yacht “Enchantress” left Beinn Bhreagh early in the morning for Labrador with Dr. Grenfell on board.

NEWS FROM PETEWAWA .

A letter has been received from Mr. Douglas McCurdy at Petewawa Camp, Ontario, to the following effect:—

McCurdy to Bell .

July 26: —We arrived at Petewawa Camp O.K. on Friday night (July 23) in a pitchfork rain, and found later that it had been raining for two weeks every day. Casey and wife are across the River, two miles away, staying at the Fort William Hotel, so I did not see them upon my immediate arrival.

The Dart shed is just big enough for one machine, and is not yet completed. Men are, however, busily at work shingling. The weather now is beautiful although terribly hot.

32

1909, July 31 Yesterday (July 26) we assembled out of doors and got the wings all together and the engine installed. That, however, requires some fitting, so it will probably be the first of next week before all is ready for a trial.

The Military here are awfully keen, and the old Colonel casually remarked to me yesterday that he was looking forward with a great deal of pleasure to a ride in the machine. All the officers are interested, and in general things look bright. The Assistant Deputy Minister of Militia is here, and is going to stay over for a flight.

The grounds are fair, not very smooth, and covered with blueberry bushes. It will, however, be perfectly safe for both machine and aviator.

The engine is a beauty all right, and leaks the part.

(Signed) J.A. Douglas McCurdy.

Mr. McCurdy says "we" arrived at Petewawa Camp etc. This refers to Mr. William McDonald who accompanied Mr. McCurdy to Petewawa to assist Messrs. Baldwin and McCurdy in their experiments.

An interesting personal letter has been received from Mrs. Baldwin, dated July 25, describing the events at Petewawa; but the points are all covered by McCurdy's letter quoted above.

The machine now being assembled at Petewawa is undoubtedly the "Silver-Dart", not the "Baddock No.1".

33

EXPERIMENTS July 23-30, 1909.

July 24: — A number of experiments with kites are reported by Mr. Bedwin; but for some reason or other none of the kites flew satisfactorily, although Mr. Bedwin obtained some good data with the white Oionos kite flown upside down in ten of the Gaudrie:— 10 observations of wind velocity, 100 of altitude, and 100 of pull. Mr. Bedwin reports:—

Double Oionos:— I tried to fly the double Oionos kite but failed to get it up. From some cause the kite seemed to dive down to starboard. It went into the water and was damaged.

Single Oionos:— We also had on board the Get-Away the red single Oionos kite. We tried to fly it but it acted just about as badly as the double one and we could not get it into the air satisfactorily. Tried attaching line further out but with no better success.

Oionos upside down:— We then flew the white Oionos kite upside down. The kite flew fairly well but seemed to show the same tendency to veer off to starboard as in the other experiments.

The data obtained with the white Oionos kite are now being analyzed and studied.

July 26:— Half-sized model of Cygnet II . This kite was released from the Get-Away on the Bay to-day, and towed by the Gaudrie. Mr. Bedwin reports a fine series of observations. 20 of wind velocity, 200 of altitude and 200 of pull. A study of these observations shows that they are of great value; and

Mr. Bedwin is to be congratulated upon having secured kite data that will be of the greatest use in determining the motive power required to propel such a structure as the Cygnet II.

34

WATER WATER EVERYWHERE AND NOT A DROP TO DRINK by A. C. Bell

Every year fishermen on the banks of Newfoundland become separated from their vessels in a fog; and before they are picked up, or make the shore in their dories, suffer terribly from thirst.

One of our men at Beinn Bhreagh had two uncles whose dead bodies were picked up at sea in a dory. There was fish in their boat but no water.

It is certainly a reflection upon the intelligence of man that anyone should die of thirst upon the Ocean; or that there should be "Water, water everywhere, nor any drop to drink".

Wherever there is water there is water to drink; and it is only our ignorance that prevents us from taking a draught. Certainly, where fog exists there is plenty of fresh water at hand, in the air; and no one need die of thirst under such circumstances.

Just consider what a fog means. It is fresh drinking water suspended in the atmosphere, half condensed, in the form of a visible cloud. All that the fisherman has to do is to pump the fog into a bottle half submerged in the cold water of the ocean, and the fog will turn into fresh drinking water.

Drinking Water obtained from fog

Some years ago at Beinn Bhreagh I tried the experiment of causing a pair of bellows to pump fog continuously into a bottle submerged in Baddock Bay; and after the lapse of a 35 few hours I found the bottle half full of fresh water. The arrangement was as follows:—

A pair of bellows was fastened securely on the Central Wharf at Beinn Bhreagh with the handles projecting beyond the edge of the wharf. A coiled spring was then placed between the handles to keep them apart; and a heavy log of wood was suspended from the upper handle, and floated on the surface of the Bay. The length of the connecting string was so adjusted that when a wave lifted the floating log the string became slack; thus allowing the coiled spring to lift the upper handle of the bellows and fill the bellows with air. Then when the wave passed, the weight of the log caused the string to become tense and compressed the bellows, thus pumping air, through a tube, into the

empty submerged bottle. Two glass tubes passed through the stopper of the bottle, their upper ends being sever 1 feet above the surface of the Lake. The air was pumped down one tube, and escaped up the other. The water-vapor contained in the air then became condensed in the bottle, and remained behind as fresh drinking water.

The apparatus was started one evening in a light fog or mist, and the wavelets kept the bellows pumping all night. In the morning the bottle was half full of fresh water.

Drinking water obtained from the breath

I tried the experiment of condensing drinking water from my breath at Mr. David Fairchild's place near Washington, 36 It is well known that water-vapor is one of the products of combustion in the lungs. If you breathe upon a mirror, or cold surface, water is immediately condensed upon the surface in the form of a mist, or fine dew.

In this experiment I took an ordinary glass tumbler and holding it partly immersed in a bucket of cold water to keep it cool, I breathed into the tumbler.

The open mouth of the tumbler almost completely covered my mouth; and I breathed in through the nose and out through the mouth.

I kept this up for an hour or so, and as a result a considerable quantity of fresh water appeared at the bottom of the tumbler, showing the case with which drinking water may be made with the simplest sort of apparatus if we can only get water vapor into a cool receiver. The total quantity of water condensed, although much exceeding my expectations, was not really large, only a few spoonfuls in all; but a man suffering from thirst upon the ocean would have given all he possessed in the world for a drink of it.

I tasted the water condensed from my breath, and found it quite fresh and without any disagreeable flavor whatever.

(The above, is taken from a dictated note made on the steamer "Cedric" on the way over the Atlantic May 21, 1909).

Amount of water obtained from the breath

Experiments to ascertain the amount of water that can be condensed from the breath were made at the Houseboat, Beinn Bhreagh July 3, July 11, and subsequently.

37

As a general result I came to the conclusion that it would be possible, without any special cooling arrangement other than the water of the ocean, to condense from the breath about 25 cubic centimeters of water per hour. In ten hours this would amount to 250 ccm of water, weighing 250 gms. (practically about half a pound of water). This would be equivalent to a full tumbler of water. Of course, with special cooling arrangements, the quantity could be increased.

The accompanying photographs Figs. 1,2,3 and 4 show some of the forms of apparatus employed in these experiments.

Fig. I (p 36) shows an ordinary glass jar held partly immersed in a bucket of cold water. The mouth is fitted loosely into the open mouth of the jar, the nose being outside. In operating the apparatus breathe in through the nose and out through the mouth into the jar. This apparatus proved rather laborious in operation on account of the constrained position of the body required.

Fig. II (p 38) shows an empty bottle floating in a bucket of cold water with its neck resting on the edge of the bucket. The end of a long glass tube passes through the neck into the bottle, and the other end of the tube is held in the mouth.

The operation of this apparatus was quite easy, and I read a book for more than an hour while making an experiment with it.

Figs. III and IV (p 39) show a more complicated, but more efficient form of apparatus. In this apparatus a glass 38

139793-A

1909 JUL 31 Fig. I Drinking water produced by breathing into an open jar.

138106-A

1909 Jul 29 Fig. II Drinking water produced by breathing into a bottle through a tube.

39

138500-A

1909 Jul 29 Fig. III The tubes employed in condensing water from the breath separately shown.

138109-A

1909 Jul 29 Fig. IV The three tubes combined. Water obtained by breathing into one glass tube through another.

40 tube was employed about 120 cm. long and having an internal diameter of 2 cm. This was plugged at the bottom with a rubber stopper.

Into this, another glass tube of smaller diameter was inserted, with the projecting end bent almost at right angles to fit conveniently into the mouth. The end which was placed in the mouth was flattened.

In operating the apparatus the breath, blown down through the inner tube, escaped up the upper tube, and condensation was immediately observed at the bottom of the outer tube. In process of time several cubic centimeters of water collected there.

The amount condensed was much increased by placing the outer glass tube in a larger tube of brass which was closed at the bottom, and filled with cold salt water from the great Bras d'Or.

The three tubes employed are shown separately in fig. III (p 39); and the mode of operating the apparatus as a whole is illustrated by fig. IV (p 39).

I came to the conclusion that such an apparatus could be operated for any length of time without fatigue. The process proved to be as easy as smoking a pipe. A.G.B.

41

1909, August 2 SOME OBJECTIONS TO THE USE OF VERTICAL SURFACES. by A.G. Bell

Progress in the art of Aerial Locomotion has developed two well-marked types of aerial vehicles, Balloons and Flying Machines (lighter-than-air and heavier-than-air machines).

A few years ago the stock argument in favor of the flying-machine was that it could cope with the wind because it was "heavier-than-air", whereas the balloon must ever be at the mercy of the wind because it is "lighter-than-air".

In view of this argument the performances of the Zeppelin dirigible balloon are truly remarkable:— It has been able to face a thirty mile wind. It has kept aloft during a storm, without injury, and has afterwards made its way back to its starting point. It has also survived, without injury, a forty mile wind while anchored to the ground in open country.

Still more remarkable, however, is the fact that the heavier-than-air flying-machine, which was supposed to be specially fitted to cope with the wind, is now preferably flown in a calm; and a ten or twelve mile breeze is accepted as a sufficient excuse for the postponement of a public exhibition.

In spite of the theory that originated the heavier-than-air type of machine, aviators have learned to fear the wind; and they now look upon it as a treacherous enemy, to be avoided as much as possible.

Thus aerodromes have not yet practically fulfilled the promise of their birth, and we are confronted by the problem:— 42 Are our theories all wrong, or is there some radical defect about the aerodrome remaining to be corrected?

We may hope for light upon this important question from the birds, the improved and perfected flying-machines evolved by nature, through a long series of selective experiments extending through countless ages.

Here the outlook is distinctly encouraging for the theory. Birds do not fear the wind; at least not nearly to the same extent as in the case of the aviator.

The best-flying birds, indeed, seem to delight in wind; and are perfectly at home in the air under the most stormy conditions. He gale is too heavy for the ocean birds; and they actually utilize the force of the wind to save their own motive power.

What a contrast between the attitude of the man and the bird in this respect. And yet it is not so much the force of the wind, as its direction, that disturbs the aviator. He can fly against the wind, or with it, without much difficulty. His troubles begin when he makes a turn, or attempts to fly directly across the wind, or obliquely to it. It is the side-wind that he specially fears.

Now when we compare the artificial with the natural flying-machine, a structural difference makes its appearance which may be of importance in this connection:— There are no normally vertical surfaces in a bird.

I have already directed attention to the vertical rudder universally employed upon aerodromes (see p. 17); and have pointed out the fact that a bird makes no use of a 43 ship's helm (1) in the process of steering. But my point is more far-reaching than this. There are no normally vertical surfaces at all in the bird (unless indeed his body may be considered as an equivalent).

Is this omission an accidental circumstance without significance, or does it indicate that vertical surfaces may perhaps be responsible for the difficulty of handling an aerodrome in the presence of a side wind.

If vertical surfaces are arranged with their flat sides turned towards the wind of advance, they act as a drag upon the machine, and are obviously out of place. By presenting their edges only, to the wind of advance, their head resistance is out down to a minimum.

But how about their side resistance. This becomes a maximum. The surfaces are presented flat-ways, not edgeways, to the action of side winds, which are thus enabled to exert their full force in pushing the machine to one side. The tendency of the machine to drift with the natural wind, whenever it attempts to cross the current of air, is thus increased and intensified by the action of vertical surfaces.

We are somewhat inclined to consider that the vertical surfaces of an aerodrome resist side-drift after the manner of a ship's keel or center-board; but this is not true as a general proposition. They certainly do have a keel-like action and resist lateral displacements not caused by wind; but, in the case considered, they actually promote side-drift instead of opposing it.

44

In the case of the ship the side-pushing force, it is true, is produced by the pressure of the wind, but the keel or center-board resists in another medium, the water, which is not moving with the wind. A ship can move across a current of air without drifting materially in the water; but the case would be different if the water itself were in motion. She would drift with the water but not with the air; and would be more at the mercy of side currents of water than if she had no keel at all. A flat-bottomed steamer propelled across a river, would undoubtedly be carried down stream to a less extent than if she were provided with a center-board or keel:—The grip of the water upon her bottom would be less.

The larger the area of the vertical surfaces in a drome, the greater will be the side push exerted by quartering winds; and if these surfaces are not exactly balanced around the center of the machine turning forces are produced tending to turn the machine around a longitudinal, or a vertical axis. For example:—

If the surfaces extend more above the machine than below, or vice versa, a side wind tends to turn the machine about its longitudinal axis, tipping it over to one side or the other.

If the vertical surfaces extend more to the rear of the machine than the front, or vice versa, then a side wind tends to turn the machine around a vertical axis to the right or the left. In the case of a vertical rudder at the rear, without an equivalent balancing-surface at the front, the rear of the machine is pushed sideways more strongly than the front, thus interfering with horizontal steering by causing the machine to swerve from its path, with a tendency to head up into the disturbing wind.

45

So long as the surfaces are truly vertical, a side wind has no tendency to disturb the longitudinal stability of the machine by turning it round a transverse axis so as to create a dive or a climb. But if the machine tips over to one side or the other, then a vertical component of pressure appears in the action of a side wind; and, if the surfaces extend more to the rear than the front, or vice versa, the end having the larger surface is pushed up, or down as the case may be, creating a climb or a dive.

There are other objections to the use of vertical surfaces quite independently of the action of side-winds upon them:—

They retard advance by their skin-resistance, thus reducing speed without contributing anything to their own support in the air.

They produce no lift, whether the air impinges upon their flat surfaces or upon their edges, and so constitute more dead-load to be carried by the machine.

See also objections to the use of a vertical rudder p 17.

Against this formidable list of objections, what advantages can be placed to the credit of vertical surfaces? The advantages all seem to result from their keel-like, or center-board kind of action, in resisting lateral displacements not caused by wind.

They resist a tipping action not caused by the movement of the air in which they are immersed, thus promoting lateral stability. This is their principal advantage, and indeed their raison d'être .

46

They resist the sluing action produced by centrifugal force in making a turn.

They also permit of horizontal steering by means of a vertical rudder but this is of doubtful advantage (see p. 17)

These are all the advantages that occur to me at the present moment; and I am much struck by the discovery that the disadvantages are many and the advantages very few.

It is significant in this connection that recent progress in Aviation reveals a tendency on the part of aviators to discard vertical surfaces as much as possible. In the most successful machines of today they are conspicuous chiefly by their absence. The vertical rudder, however, still remains in all.

The double-surface, and triple-surface machines cannot, of course, get rid of the vertical struts which serve to hold the surfaces together. The single-surface machines have, however, discarded even these; and the success of Bleriot in crossing the British Channel in such a machine is fraught with significance.

I am quite startled by the suspicion that after all, the use of vertical surfaces may turn out to be the cause of our difficulty in handling an aerodrome in a heavy wind; and by the consideration of the changes in structure which will result should the proposition be established on a basis of fact. A. G. B.

47

THE LAST FLIGHT OF THE SILVER-DART.

The following telegram has just been received from Mr. Baldwin at Petewawa:—

August 2: —Made four flights early this morning. Carried two nicely. First flight aviator only. Second and third flight McCurdy and Baldwin third flight. McCurdy, McDonald in fourth flight. Rising sun got into our eyes, and the machine dropped a small knell damaging her beyond repair. Aviator absolutely uninjured. Baddeck No. 1 here, and assembling will begin at once. (Signed) Baldwin.

48

1909, August 4 THE ACCIDENT AT PETEWAWA .

August 3: — The following telegram was sent this morning to Mr. Baldwin, at Petewawa:—

Baddeck, August 3: — Great excitement here about Silver-Dart. Hope all well. Why not stick to one man in the new aerodrome until engine has been well tried out and experience gained, remember Selfridge. Good luck to Baddeck No. 1. Hope you and Douglas will keep me posted. Thank Kathleen for her breezy letter, want more.

(Signed) Graham Bell.

August 4: — The newspapers of August 3 give a somewhat alarming account of the accident at Petewawa; and speak of both Baldwin and McCurdy as being injured and in the hospital.

I have confidence, however, that Baldwin would not have said “aviator absolutely uninjured”, if anything serious had happened. We are all anxiously awaiting news by mail; and I have sent the following telegram to Mr. McCurdy:—

Baddeck, August 4: — Think you better telegraph Aunt Georgie. Newspaper accounts disturbing.

(Signed) Graham Bell)

Miss Georgina McCurdy, and Mrs. Front, Douglas McCurdy's sister, are as anxious to know the truth as we are.

A. G. B.

THE GREAT EVENT OF JULY AT BEINN BHREAGH .

Photographs are appended illustrating the great event of July at Beinn Bhreagh:— The arrival of the Shetland pony from England. (see pp 49, 50).

49

117166a

The great event of July 1909:— The arrival of the pony from England. Master Melville Grosvenor does not seem to be at all afraid of the pony on his own account but look at the picture below. Photo by G.H. Grosvenor

116806A

Melville Grosvenor fears for his little sister Mabel and prevents her from going too near the pony
Photo by G.H. Grosvenor

50

117167A

Mrs. Fairchild holding her son Alexander Graham Bell Fairchild on the pony's back. Mrs. Bell prevents Lilian Grosvenor from approaching too near. Photo by G.H. Grosvenor.

117169A

Master Melville Bell Grosvenor on the pony's back. Photo by G.H. Grosvenor.

51

1909, Aug. 5,

The yacht "J.A. McCosh", presented by Princeton Students to Dr. Grenfell, with a party of Students on board. Arrived Beinn Bhreagh July 21, left July 26. Photo by J. McNeil.

Taken 1909 July 15 The old "Ugly Duckling" converted into a House-boat for camping-out purposes. Photo July 15. Photo by J. McNeil.

52

1909 July 29 The steam yacht "Enchantress", which arrived at Beinn Bhreagh July 29 to take Dr. Grenfell to Labrador. Left July 30. Photo by J. McNeil.

53

1909, August 6 Half-sized model of Cygnet II, on the tilting-arms of the "Get-Away". Photo by J. McNeil.

Side-view of Cygnet model showing hollow interior. Photo by J. McNeil. For kite data secured July 1909 with this model see p. 54.

54

MODEL OF CYGNET II, JULY 1909 .

738 winged cells. Surface 39.9 sq. m. oblique. Weight 27.2?0 kg., or 60.0 lbs. Weight of rope 4.852 kg. or 10.7 lbs. Weight of cord 1.053 kg. or 2.3 lbs.

Conditions Observations Date Exp. FL BL Wind Pull Altitude July 6 1 r100 r200 17.60 mph 32.0 lbs 8°.3 July 6 2 r100 14.25 mph 52.5 lbs 13°.8 July 12 1 r100 r200 17.10 mph 70.5 lbs 15°.8 July 12 2 r100 r200 15.60 mph 68.5 lbs 15°.2 July 12 3 r100 r200 15.16 mph 71.0 lbs 15°.3 July 12 4 r100 r200 17.00 mph 68.5 lbs 15°.5 July 12 5 r100 r200 16.25 mph 70.5 lbs 15°.7 July 12 6 r100 r200 17.50 mph 66.0 lbs 15°.0 July 12 7 r100 r200 16.40 mph 68.5 lbs 15°.0 July 12 8 r100 r200 17.60 mph 65.0 lbs 14°.5 July 12 9 r100 r200 18.00 mph 66.8 lbs 14°.4 July 12 10 r100 r200 16.25 mph 51.5 lbs 10°.9 July 26 1 r100 c200 19.60 mph 17.0 kg. 21°.1 July 26 2 r100 c200 18.50 mph 13.2 kg. 19°.6 July 26 3 r100 c200 19.20 mph 17.? kg. 21°.3 July 26 4 r100 c200 15.40 mph 15.6 kg. 20°.1 July 26 5 r100 c200 16.60 mph 13.4 kg. 19°.7 July 26 6 r100 c200

18.00 mph 12.4 kg. 17°.8 July 26 7 r100 c200 20.00 mph 14.2 kg. 20°.5 July 26 8 r100 c200
16.70 mph 14.8 kg. 19°.7 July 26 9 r100 c200 17.40 mph 12.9 kg. 17°.2 July 26 10 r100 c200
18.00 mph 11.7 kg. 16°.1 July 26 11 r100 c200 17.40 mph 12.4 kg. 16°.7 July 26 12 r100 c200
17.30 mph 15.8 kg. 22°.4 July 26 13 r100 c200 17.00 mph 13.8 kg. 19°.6 July 26 14 r100 c200
21.00 mph 13.0 kg. 22°.5 July 26 15 r100 c200 20.60 mph 20.8 kg. 26°.9 July 26 16 r100 c200
22.40 mph 22.2 kg. 21°.9 July 26 17 r100 c200 22.60 mph 22.6 kg. 22°.6 July 26 18 r100 c200
22.40 mph 21.1 kg. 22°.2 July 26 19 r100 c200 21.50 mph 25.0 kg. 25°.0 July 26 20 r100 c200
20.80 mph 26.2 kg. 23°.5

Each observation of altitude and pull is the mean of ten readings. Contractions: — FL flying-line; BL bow-line; r rope; c cord; mph miles per hour; lbs pounds; kg kilograms; sq. m. square meters; exp experiment; r100 rope attached 100 cm from center; c200 cord attached 200 cm. from center.

55

The upside-down Oionos kite, with its tail to the left. Photo by J. McNeil. For data secured with this kite July 1909 see p. 56.

The upside-down Oionos kite in the air, towed by the Gaudrie. Photo by J. McNeil.

56

UPSIDE-DOWN OIONOS KITE JULY 1909 .

For photo see p. 55. Horizontal surfaces 6.2500 sq. m; oblique surfaces 8.0161. Estimated total surface 18.8493 sq. m. oblique, or 10.8750 sq. m. horizontal. Weight 13.113 kg. or 25.9 lbs. Weight of rope 4.352 kg. or 10.7 lbs. Weight of cord 1.053 kg. or 2.3 lbs.

Conditions	Observations	Date	Exp	FL	BL	Wind	Pull	Altitude
July 12 1	r 50	11.50 mph	27.5 lbs	18°.3	July 12 2	c 50	12.90 mph	37.6 lbs 34°.6
July 12 3	c 50	9.40 mph	37.0 lbs 38°.5	July 12 4	c 50	10.50 mph	35.0 lbs 36°.4	July 12 5
c 50	12.40 mph	34.5 lbs 35°.9	July 12 6	c 50	11.00 mph	35.5 lbs 32°.1	July 12 7	c 50
10.40 mph	34.6 lbs 34°.2	July 12 8	c 50	13.10 mph	38.4 lbs 29°.3	July 12 9	c 50	11.20 mph
34.4 lbs 33°.9	July 12 10	c 50	11.30 mph	36.5 lbs 34°.3	July 12 11	c 50	10.50 mph	36.3 lbs 32°.6
July 13 1	r 50	c150	13.95 mph	37.0 lbs 21°.4	July 13 2	r 50	c150	22.18 mph
39.0 lbs 21°.0	July 13 3	r 50	c150	21.85 mph	29.0 lbs 15°.6	July 13 4	r 50	c150
18.10 mph	23.5 lbs 13°.3	July 13 5	r 50	c150	18.60 mph	23.5 lbs 13°.7	July 13 6	r 50
c150	18.25 mph	22.0 lbs 13°.8	July 13 7	r 50	c150	19.20 mph	24.0 lbs 14°.7	July 13 8
r 50	c150	19.40 mph	22.5 lbs 14°.6	July 13 9	r 50	c150	19.00 mph	23.0 lbs 13°.9
July 24 1	c 50	21.00 mph	11.6 kg. 29°.5	July 24 2	c 50	20°.0 mph	13.6 kg. 28°.9	July 24 3
c 50	20.00 mph	12.5 kg. 26°.1	July 24 4	c 50	21.15 mph	13.2 kgs 26°.3	July 24 5	c 50
22.00 mph	14.2 kg. 28°.3	July 24 6	c 50	21.50 mph	14.7 kg. 25°.9	July 24 7	c 50	22.00 mph
15.0 kg. 27°.7								

July 24 8 c 50 24.40 mph 12.0 kg. 27°.3 July 24 9 c 50 22.20 mph 13.0 kg. 27°.6 July 24 10 c 50 20.20 mph 11.6 kg. 29°.0

Each observation of altitude and pull is the mean of ten readings. Contractions: — FL flying-line; BL bow-line; r rope; c cord; r100 rope attached 100 cm from center; c150 cord attached 150 cm from center; mph miles per hour.

57

Children's party at Beinn Bhreagh Hall July 26 The birthdays of Gertrude and Mabel Grosvenor both occurred on July 28. The party July 26 was in their honor. Photo by G. H. Grosvenor.

58

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Dr. Grenfell and Dr. Bell at B. B. Nursery July 27. Photo by G. H. Grosvenor.

68822-T

Dr. Grenfell, Dr. Bell, and Mr. Davidson examining sheep. Photo by G. H. Grosvenor.

59

can't find

The rustic colonnade in the flower garden at Beinn Bhreagh Hall. Photo taken by G. H. Grosvenor late in July 1909.

60

Aug. 7 THE SILVER-DART AT PETEWAWA.

August 7: — Letters have been received from Mrs. F. W. Baldwin dated August 2 and 3; and also a letter from Mr. Douglas McCurdy (August 2), which enable me to put on record the main facts concerning the four flights of the Silver-Dart at Petewawa August 2.

1st flight:— McCurdy alone.

2nd flight:— McCurdy and Baldwin.

3rd flight:— McCurdy and McDonald.

4th flight:— McCurdy and Baldwin.

All these seem to have been good flights of about half a mile each; but a bad landing was made at the conclusion of the fourth flight.

The machine was badly damaged, but perhaps not beyond repair.

We are more concerned, however, with the fate of the aviators than of the machine; and I am glad to report that McCurdy and Baldwin escaped with nothing more serious than bruises and scratches.

According to Mrs. Baldwin, McCurdy got his nose and cheeks pretty badly scratched, and Baldwin had his leg "a bit scraped," and this seems to be all.

McCurdy is staying at the military camp at Petewawa in Ontario; and the Baldwins are about two miles away on the other side of the Ottawa River, at Port William in the Province of Quebec. Mrs. Baldwin says:(August 3):— In reference to Baldwin "He is perfectly well, and enjoyed a good breakfast". In reference to McCurdy she says:—

61

I haven't seen John yet and don't expect to for some days as his face is anything but beautiful to behold, so I imagine he will keep himself in hiding till it looks a little more presentable. ***In case you are wondering the extent of John's damages he got his nose and cheeks pretty badly scratched. Casey says he looks as if he had been in a prize fight."

I am sure that all on Beinn Bhreagh will join me in congratulating Messrs. McCurdy and Baldwin upon their escape from what might have been a very serious accident.

In giving an account of the details of the events of August 2 at Petewawa, I can do no better than quote an extract from McCurdy's letter to Mrs. Bell written upon the date of the occurrences described. Mr. McCurdy says (August 2):—

Petewawa, August 2: — Thank you so much for your nice letter received night before last. I can't tell you how much I miss Baddeck, and all you people.

Well, to-day was a red-letter day for us. We sent you a telegram telling of the flights with the Silver-Dart. We were awfully anxious to have a few private and secret trials to test out the new engine, and also to find out how well she would carry two. Another point was to ascertain if the balance was correct.

We are attacked on all sides, and at all times, with newspaper men; and in fact they are camping across the Lake so as to be on hand to take in the flights.

Well, we planned to go out on Sunday morning early, but it was too windy. The whole military camp were suspicious that we were concealing something, so this morning we got up at four o'clock, and stole away in the moonlight, waking Willie McDonald on our way.

At five o'clock we wheeled the machine out on the grass, and I took the operator's seat, and Casey twirled over the propeller. She started first crack, and instantly the machine sped along the ground light as a feather, and rose into the air as of yore.

I flew for about one-third of a mile in a straight line, and then landed without accident. Casey and Willie came up then, and we decided to try a two-man flight for the first time.

62

Casey and I went together, and the balance was good, and the Dart rose in about as short a run as before, and we flew back to the shed one-half a mile. We were, of course, very much pleased, and when Willie came up we asked him to ride.

Without a moment's hesitation he got in, and away we flew as before to the limit of the field.

Then Casey and I started home again for the fourth flight. This one was the best of all, but—

Just as we were about to land, the front wheel struck a knoll, and bounded up throwing the starboard wing down where she struck another small-sized mountain, a very young one, and it was all over.

We landed on the grass, one on top of another, and the machine quite near us. The starboard wing was badly smashed.

We have decided not to repair her now, but go ahead on Baddeck No. 1, which machine arrived on Saturday. This morning and afternoon (Aug. 2) we got her out of the crates, and the center section assembled. The motor will probably be brought down from the shed to-morrow afternoon and installed; and then the rest of the assembling completed by Friday, when we hope to try her out.

The point about the engine has been very satisfactorily demonstrated, and she is a dandy. Please tell Mr. Bell that there was not a delay of one-half minute in getting under way. She always starts first

turn of the propeller and turns up, with the gear we are now using, 1400 – 1500 rpm. with a ratio of 16:30, so the propeller turns about 900 rpm.

The speed of the Dart was, I should judge, about 45 to 50 miles per hour, and the controlling is as easy with two as with one.

I do wish that you and Mr. Bell could see the Baddeck No. 1 fly. The grounds are not as good as the field in Baddeck; so we will, perhaps, decide to fly No. 2 there. etc.

(Signed) Douglas.

McCurdy and Baldwin, rightly, I think, have adopted in their new aerodrome a commercial automobile engine whose endurance has been fully tested for motor-car work, instead of an experimental engine specially made for serial work.

63

The light engines manufactured especially for use in flying-machines, while having the power to raise the machines into the air, have not proved very satisfactory in the matter of endurance. They cannot be relied upon for extended flights, and must be considered as only in the experimental stage.

Messrs. McCurdy and Baldwin visited several manufacturers of motor car engines, but the lightest commercial engine they could find fulfilling their requirements proved to be much heavier than the heaviest of the experimental engines they had hitherto employed; and it was somewhat problematical as to whether it would have power enough to raise itself and a man into the air, in such an aerodrome as the "Silver-Dart".

The flights of the "Silver-Dart" at camp Petewawa, Aug. 2, have shown that it has not only abundant power for this purpose, but can also carry the additional load of another man.

This result is very important; and will speedily be followed, I believe, by the adoption of automobile engines by other aviators in the propulsion of their machines.

A.G.B.

64

BEINN BHREAGH . July 26– Aug. 6.

Birthday Party on Beinn Bhreagh.

July 26: — Mrs. Bell gave a birthday party to her two granddaughters, Gertrude Hubbard Grosvenor, and Mabel Grosvenor whose birthday was on July 26. Both children were born on Beinn Bhreagh, Gertrude in 19?3, and Mabel in 19?5, and Mrs. Bell makes them happy each year by a party.

All the children on Beinn Bhreagh were present, but owing to the prevalence of whooping cough and other childrens' sickness across the Bay, Mrs. Bell thought it best to limit the party this year simply to Beinn Bhreagh Children.

Those children present in addition to Gertrude and Mabel were:— Melville Bell Grosvenor, Lilian Waters Grosvenor Alexander Graham Bell Grosvenor, Alexander Graham Bell Fairchild, Barbara Lathrop Fairchild, Thomas Byrnes, Edith, Ruth, and Mabel Davidson, Ethel and Marian McDonald, Edith, Edna, and Ruth Rudderham, Jonhi? Pike, Georgina McCurdy Frest, and Aileen Stair?. ?.H.C.

65

July 27: — There was a race to-day between the Qui Viva and the canoe:— Result a draw. W.F.B.

July 28: — ?alcon McFarlane is laid up with sore eyes. W.F.B.

July 28: — A Bowser gasoline tank and pump have been received at the Laboratory. It is proposed to do away with the unsightly and dangerous gasoline casks scattered all over the estate, and substitute a good gasoline tank at the Laboratory from which employees and others can obtain gasoline at reasonable rates. W.F.B.

Distribution of Sheep Among Farmers .

July 28: — An Beinn Bhreagh Nursery has adopted a new policy this year in its sheep department of giving away good, young, four and five multi-nippled Ewen, and as I had previously arranged with Farmers who were to get these sheep the conditions they were given ?n, I decided last week to pick out all our six, seven, and eight nippled sheep we propose to keep, so as I could then notify the Farmers to come and get their presents of sheep.

This date (July 28) was decided on with all the Farmers I could see in town Saturday evening; and it is noteworthy, and I presume in line with human nature, anything to be given away is eagerly sought after.

The farmers were early on the scene, one being here by seven A. M. after traveling nine miles with a horse and 66 cart. The distribution of to-day (July 28) was as follows:— William Crowdis, Baddeck Inlet, two ?wes; A.Y. McDonald, Baddeck Inlet, three ewes; Angus McInnis, Brookside Farm, Big Baddeck, four ewes.

All highly appreciated the gift, and left with high expectations of bringing back to us some eight and ten-nippled lambs next year to receive fancy prices for them. J.C.D.

July 29: — In connection with the proposed hospital sledge for Dr. Grenfell to be driven by a gasoline engine and aerial propeller, Dr. Grenfell promised to make a drawing for Mr. Badwin of the kind of sledge he uses in Labrador with a dog-team. He made this drawing immediately before his departure from Beinn Bhreagh, (July 29) and added a short description. The original note with the drawing have been handed to Mr. Badwin and I quote the following from the description:— A.C.E.

Dr. Grenfell's Dog-Sledge.

July 29: — Dog-sledge 12 feet by 25 inches overall. 10 feet on the ground, about 8 inches high, made of hickory, and no fastenings except skin lashings. Our runners are steel or bone, screwed on and counter-sank, and are about one and a half to two inches wide.

There is no reason why it should not be wider than 25 inches, but I think 28 to 30 inches should be the limit. 67 I should keep it low also for fear of capsizing, but there must be a few inches to pass over an irregular lump and clear the latter. I will send a better picture by post. W.C.

July 30: — The steam yacht "Enchantress" sailed early this morning for Labrador with Dr. Grenfell on board.

Davidson Pays Big Prices for Sheep .

July 30: — Mr. Ferguhar A. Mackae of Big Baddeck brought to Beinn Bhreagh Nursery to-day three six-nippled, and one seven-nippled lamb for which he received \$45.00. That is, ten dollars for each six-nippled, and fifteen dollars for the seven-nippled. He was also presented with four young four-nippled ewes as an extra bonus.

Mr. MacRae was the first farmer around to take advantage of our liberal policy.

In the fall of 1906 I offered to Mr. MacRae the use of a six-nippled male to mate his entire flock, on the condition that I would have the option of buying from him all offspring having six or more nipples for Dr. Bell's flock.

In the spring of 1907 Mr. MacRae had the good fortune of having born four six-nippled, and one seven-nippled lamb, but unfortunately lost four of these lambs after they were left out to the pasture, only saving one, for which he received the sum of ten dollars.

The following spring of 1908 Mr. Macrae again had the use of our ra? with the above stated results.

68

Not many farmers in Victoria County can boast of receiving such high prices for their lambs, although a great have had the same opportunity of trying the experiment, same as Mr. Macrae.

I am pleased to say farmers are beginning to look on Beinn Bhreagh Sheep in a different light from former years. Those who have used our rams last fall admit that their lambs this summer are equal if not better than those produced from their society sheep. J.G.D.

July 30: — Winslow Staples, J.V. MacLead, Albert H. Macleod, W.A. Fitch, and A.A. McIntyre of Sydney visited Beinn Bhreagh Nursery July 30, and were shown all over the grounds by the Supt.

They also had the pleasure of meeting Dr. and Mrs. Bell, and Mr. and Mrs. C.N. Grosvenor at Beinn Bhreagh Hall, and enjoyed afternoon tea with them, which they appreciated very much, and left Beinn Bhreagh with happy recollections of their afternoon's outing. J.G.D.

69

1909, August 9 July 31: — Ross, with the Qui Vive had a smash, destroying his rudder, and breaking one blade of his propeller. W.F.B.

July 31: — Bedwin reports:— "Davidson got into trouble with his motor-boat the Edruma and had to be towed to the Laboratory for repairs". (Who? The Edruma or Davidson? A.G.B.)

Davidson crows over the B.B. Motor experts.

July 31: — Motor-boat Edruma started to-day to deliver some vegetables to Miss Georgina McCurdy, Baddeck Bay,

By hitch and by kick she managed to reach the Central Wharf, where Captain McDonald of the Gauldrie examined the engine and decided the spring behind the contact-ball was too weak.

Mr. Byrnes kindly offered his motor-boat Shamrock to tow the Edruma to the Laboratory, where Chief Machinist, A. Ross, in five minutes time had a new spring in, but failed to get the engine to work.

It being lunch time all Laboratory motor experts left the Captain of the Edruma to solve the problem himself, which he soon accomplished, and delivered his produce and reached home safely although a heavy sea was running at the time. J.G.D.

July 31: — Mr. William McKensie of Big Baddeck, sent his two sons here to-day with a team for two sheep. Mr. McKensie used our black seven-nippled male last fall to secure some black offspring, but was not successful in color 70 or nipples. He was to-day presented with two black ewes.

Accident to Maggie Campbell.

August 1: — Miss Maggie Campbell visited the farm house on the top of the mountain to-day, tripped on a stone and fell from the top to the bottom of the stairs, sustaining injuries that, it is feared, will keep her for some time in bed. Both ankles were sprained and she was unable to walk, and was driven to the Point where Dr. McDonald saw her. He reports that her injuries are not serious, and that she will be out again in a few days, but that she will have to be careful of her feet for a long time. A.G.B.

American Visitors at B. B. Nursery.

August 1: —Miss Elsie Hincken, and Miss Nadge Sutherland Clark, of New York City, who have been staying at the Bras d'Or Hotel for the past month, telephoned from the Hotel asking if they could be shown the flowers and grounds at B. B. Nursery. They had heard so much of this the past week; or, as Miss Clark put it, they had seen so many beautiful flowers that came from here the past week that she thought she must be living in California and not cape Broton.

They were delighted with everything around, and seemed to be well acquainted with all kinds of flowers. They said they did not think it was possible to grow such perfect roses and flowers of all

kinds in this part of the country, and left with the impression that Baddeck and its surroundings were not entirely the outskirts of the world after all.

J.G.D.

71

August 2: — Word received from Malcolm MacFarlane not very encouraging. His eyes are not any better, if anything they are worse. V.F.B.

August 2: — The motor-boat Qui Vive was fitted with an Orswell ignition apparatus, and on testing out, the engineer found that she turned up an extra 250 rpm., over which he was jubilant. BUT, on examination, it was found that one blade was broken off the propeller, so that the Orswell after all is not entitled to all the credit given to it by the owner so enthusiastically. W.F.B.

Sheep for Morrison, McDonald and MacRae

August 2: — Mr. John Morrison of Baddeck Bay sent a team early this morning to take away some of the B. B. Sheep that are being distributed throughout the country. Mr. Morrison, at the same time, took some away for Mr. A. J. McDonald, Baddeck Bay, who is at present at Petewawa with Messrs. McCurdy and Baldwin.

Mr. Macrae, of Bentick Farm, Big Baddeck, was a visitor to B. B. Nursery, and shared in the distribution of sheep now going on. This was Mr. Macrae's first visit to Beinn Bhreagh in the summer months, and he was charmed with the beauty and scenery of the place, although, as he added, he felt rather ashamed of himself when he compared his own root crops with that of Beinn Bhreagh adding he did not know what we would produce here had we the fine soil of his meadows, where you can plough for days and never see a stone.

J.G.D.

72

August 2: — It is reported that Northern Lights were visible here this evening. A.G.B.

Arrival of Mrs. Edwin ? A . Grosvenor .

August 3: — Mrs. Edwin ? A . Grosvenor of Amherst, Mass. arrived at Beinn Bhreagh to-day on a visit to her son, Mr. Gilbert H. Grosvenor. Her husband, Professor Grosvenor, is about to leave for Europe in search of rest and recreation AGB

August 3: — We were startled to-day by a telephone message from town announcing a forest fire upon Beinn Bhreagh, apparently on the further side of the mountain near the House-boat. Messengers were sent off post haste to investigate, and reported that it was a false alarm caused by a brush fire on a neighbor's property further down the Big Bras d'Or.

August 3:— Mrs. Miller Magill and Mr. Dych?an, Mr. and Mrs. Frost, and Mr. and Mrs. Wm. Kerr were visitors at Beinn Bhreagh Hall to-day.

Notice to Beinn Bhreagh Employees.

August 4: — Mr. Bedwin, Supt. of BB Laboratory, announces the completion of a storage tank for gasoline at the Laboratory, where gasoline may be obtained during Laboratory hours. Price 25 cents per gallon to employees upon Beinn Bhreagh; 30 cents to outsiders.

Mr. Davidson, Supt. of BB Nursery, wishes it made known through the columns of the Recorder that he will supply fresh vegetables and fruit in season at market prices to 73 any employee on Beinn Bhreagh on Tuesdays, Thursdays, and Saturdays, if the orders are given the day before. He can also supply new or old potatoes.

Baddeck Races .

August 6: — Annual motor-boat race to-day at Baddeck. The following motor-boats, five of them Beinn Bhreagh boats, took part in the race. Motor-boats Piper, Jap, Lusitania, (BB), Cherub, Qui Vive (BB), Lilac, Bandalph (BB), Gauldrie (BB), Aberdare, Sw?rm (BB).

There was a poor start all round owing to the follows not being sufficiently posted as to the starting gun and other details. The boats finished in the following order. Piper, Jap, Lusitania (BB), Cherub, Qui Vive (BB), Sw?rm (BB) The rest of the boats dropped out after the first few minutes.

The annual sailing races are on for this afternoon. WFB

August 5: — BB Nursery supplied the Hall with ripe tomatoes to-day, the first of the season. J.G.D.

American Visitors at Nursery

August 6: — Alexander Anderson of the Bras d'Or Hotel, had two teams on Beinn Bhreagh this afternoon with a party of ladies and gentlemen. They called at BB Nursery and asked if they could be shown around.

They were all highly pleased with the surroundings, and were carried away with the magnificence of the flowers, remarking that in New York they had never seen flowers of 74 the different kinds grow so large. They appreciated very much the privilege of seeing the place.

The names of the party were:— Mr. and Mrs. George Rockwell of Waterbury, Conn.; Mrs. David Graham, and Misses Agnes Mawson, Estelle Salingre, and Sarah C. Terry of New York; and Miss Mabel Anderson of Baddeck. JGD

August 6: — Mr. Davidson, Mr. Byrnes, and Mr. Bedwin will now keep visitor's books, and will request visitors to register their names. In this way we may be able to secure a record of the names of the strangers who visit Beinn Bhreagh and the dates of their visits.

Our sick-list.

August 6: — Mrs. Bell has been having considerable trouble with her foot (sprained July 29). It is still such discolored and swollen although she is able to walk upon it. The doctor says it takes a long time to get over a sprain especially when the ankle is sprained for the second time.

Miss Mabel B. McCurdy still goes round on crutches as the result of a sting from an insect received July 23. The local condition is much improved, however, and the doctor reports she will soon be all right.

Miss Maggie Campbell is still in bed from injuries received August 1 by falling down stairs. Both feet have been sprained, and one has just been set in a plaster cast. The doctor thinks she will soon be able to go about on crutches but it will be a long time before she regains complete use of her feet. There seem to have been no internal injuries, 75 and, excepting for her feet, she feels perfectly well.

Mr. McFarlane's eyes seem to be no better yet according to latest reports. AGB

LABORATORY NOTES . by W.F.B. Supt.

July 31: — Received all the fish-shaped stock, and rib and chord material for the new Oionos aerodrome.

The sockets for machine are well under construction; and the sail silk will arrive in about two weeks per letter from shippers. J. Leckie & Co., 77 Wellington St., Toronto.

August 2: — Have started in glueing up the ribs for the new Oionos machine to-day. Ribs for center surface are to be the same as used in Baddeck No.1. These for top and bottom surfaces to be of special shape, though of same general curve on bottom side as the center surface. But necessarily (for strength of lateral chord) they have a higher curve on top thus permitting of a large enough chord being inserted at proper place.

August 2: — Half-sized model of new Oionos aerodrome coming along well. Ribs are nearly all glued up, and chords all out. Also strut material. Sockets have been finished for some days. Expect to assemble soon.

August 2: — Estimate of weight of new Oionos machine:—

Wing piece say 90 kg.

Power plant say 205 kg.

Chassis & wheels say 40 kg.

Controls, truss, etc. 70 kg.

425 kg.

76

Details of Wing piece.

18 long ribs 1.25 thick ? 275 gms. = 4.950 kg.

7 long ribs 2.5 thick ? 550 gms. = 3.860 kg.

30 short ribs 1.25 thick ? 184 gms. = 3.520 kg.

12 short ribs 2.5 thick ? 370 gms. = 4.440 kg.

48 m Lateral chords ? 537 gms. = 26.736 kg.

120 sockets with bolts ? 55 gms. = 6.600 kg.

133.6 m Fish struts ? 156 gms. = 20.826 kg.

141 sq m cloth ? 107 gms. = 15.057 kg.

10 sq m canvas for reinforcing = 2.000 kg.

89.909 kg.

Estimated Surface .

Fare horizontal 36 sq m

Resolved horizontal 24 sq m

Total 60 sq m

Flying Weight .

$425/60 = 7.00$ kg. per sq m

WFB

N.B. In making the above estimate Mr. Bedwin seems to have forgotten that there is to be a man on the machine. He does not seem to have included the weight of the man. AGB

ELECTRIC SAFETY SWITCH . by Kenneth Ingraham.

Mr. McCurdy at Petewawa has placed an order with the Canadian Aerodrome Company for an electric switch for the new aerodrome Baddeck No. I. We have endeavored to make it a safety switch. It is simple to operate, and simple in construction, having only two moving parts.

We will suppose the motor to be running, and the operator wishes to stop it. He can do so by applying the thumb of the right hand to the nearest moving part, and then the switch becomes locked in the open position.

We apply the switch again you must use both thumb and finger, as the two parts work in opposite directions, which is the safety feature. The two working opposite makes it impossible for anyone to apply the switch accidentally, by brushing against it with the clothing, as was the case with the former switch. KI

N.B. Mr. David Fairchild had a narrow escape from being struck by an aerial propeller beside which he was standing, while at Hammondsport, N.Y. Mr. Ingraham was, at the time, working at the engine; and accidentally turned on the electric switch by brushing against it with his clothing. It was fortunate for Mr. Fairchild that the engine refused to budge without being cranked. The present safety-switch is designed to prevent the possibility of a similar occurrence. AGB

THE WORK OF THE FARM DEPARTMENT by Percy Manchester, Supt.

July 28: — The hay crop in general on Beinn Bhreagh is very creditable this year. In general it is a mixture of Timothy and Red Clover, which is of very good feeding value for all kinds of stock. Besides being of good quality it also exceeds other years in quantity. Regardless of the large acreage under grain and pasture, I think that this year's harvest of hay will be the largest ever harvested on Beinn Bhreagh.

78

The oat crop is looking very promising, and if the weather continues favorable, it will not be below my expectations.

The barley crop on account of too much wet weather, was very much affected by rust. At present, however, it is looking somewhat better, and prospects are for a fair yield.

We are now hoeing and thinning the root crop. On account of having so much tile draining to do, this very much delayed us in putting in the crop. Consequently we are now working at the root

crop when we should be haying. However, we will finish thinning the roots to-morrow, and will then commence haying at once.

The men that are employed on the Farm at the present time are as follows:— Jack McIver, of Big Hill (Stable man); Neil McDermid, and Dougald McDonald of Bed Mead, Jack McFarlane, and John Nicholson of Baddeck, at field work. PM

FOUR-HORNED SHEEP FOR FARM DEPARTMENT

August 7: — Mr. Manchester, who has charge of the agricultural land on Beinn Bhreagh, with the exception of that used by BB Nursery, makes a report upon the crops now being raised which is very encouraging (see p 77). The bay is now nearly all in; and certainly we have never had such a fine and large crop on Beinn Bhreagh before, during all the twenty or more years I have owned the place.

Mr. Manchester also has charge of the repairs of roads on Beinn Bhreagh; and of the experiments to save the land 79

Head of Ram owned by Col. Platt of Gorddinog, Llan-fairfechan, North Wales. Photo copied by J. McNeil from a paper print. This gives a good idea of the appearance of the sheep now being imported into Beinn Bhreagh from the flock of Admiral Anson of Poynton Towers, near Stockport, England. The breed is the same. The Rams have four horns like the above. Admiral Anson calls them Zulu Sheep.

80 from being washed away at Beinn Bhreagh Harbor.

The Farm Department will soon receive from England a flock of very peculiar sheep. They are partly black and partly white. While some are pi?bald, others are white with black spots, the young lambs being spotted somewhat like leopards. But the chief peculiarity of the breed lies in the magnificent horns of the rams. They have four horns instead of two.

A photograph of the head of a ram of this breed, which belonged to the flock of Colonel Platt of North Wales, is shown on page 79 from which the appearance of the rams may be judged.

Sheep of this breed (which is believed to have originated in Africa) have been kept as lawn sheep on noblemen's estates in Great Britain for more than one hundred years. They seem to be unknown in America; and I was fortunate in securing a small flock of them, during my recent visit to England, from Admiral Anson, of Poynton Towers, near Stockport, England. He thinks they are "Zulu" sheep and came originally from Capetown, Africa, but is not very certain about the matter. The ancestors of

the flock purchased have been in Great Britain for many generations; and the sheep themselves are thorough-breds of this breed, whatever the correct name may be.

The sheep are expected to leave Liverpool to-day (Aug 7) by the Steamer Tabac? for Halifax. AGB

81

WORK OF DEPARTMENT OF BUILDINGS AND WHARVER.

Aug. 7:— Mr. Charles Byrnes, Supt. has made a report on the work of his Department, which is summarized here.

Mr. Byrnes has supervision of the Buildings, Wharves, and beats on Beinn Bhreagh; and of the telephone system connecting the buildings with one another and with town. He also has charge of the e?ill which has been in full operation for sometimes past; and of the experiments now being made on the estate relating to the sanitary disposal of sewage matter by cremation.

He is now at work upon a handsome gate-way, flanked by stone pillars and to be placed at the entrance of Beinn Bhreagh estate.

He is also making plans to be submitted to Mrs. Bell for the erection of a concrete pier at the Point, so shaped as to afford a safe harbor there for small boats.

Recent Work of the Department .

The erection of two dwelling houses. One of these is now occupied by Mr. Byrnes and his family; the other is Mr. Baldwin's Bungalow, near the Laboratory.

The removal of the residence formerly occupied by Mr. Angus McInnis to a new site near the cattle barn. The building is now occupied as a farm house by Mr. Manchester 82 Supt. of the Farm Department.

The demoltion of the old MacA?lay homestead. The building was nearly?0 years old, and past repair. The chimney still stands to mark the site.

The laying of pipes to supply Mr. Baldwin's Bungalow with water from the McNeil spring.

The digging of a well at a spring not far from the old MacA?lay homestead; and the laying of pipes to connect it with the cattle barn, the farm house, the warehouse, and Mr. Byrnes' cottage. These pipe lines form the beginning of a comprehensive water system for Beinn Bhreagh, which will ultimately give watering troughs for cattle and sheep on the higher pastures of the mountain, and supply water, under sufficient pressure for fire purposes, to the buildings on the estate at a lower elevation. The connection with the spring is only temporary, until the larger plans can be carried out.

The installation of an acetylene-gas plant at Beinn Bhreagh Hall to replace the old system of lighting by kerosene lamps. The new method of lighting is much more satisfactory than the old, and costs no more.

A Glass-bottomed House-boat.

The old "Ugly Duckling", for which we have no further use at the Laboratory, was recently turned over to Mr. Byrnes to be converted into a house-boat for camping out purposes. He has built a small house upon it; but, as may be seen from the photograph on p. 51, it has turned out to be rather heavy for the floats.

In order to supply a better margin of flotation it is now proposed to place between the copper floats a flat-bottomed wooden boat. This will be provided with a glass window in the bottom, after the manner of the celebrated glass-bottomed boats of California. An opening will be made in the floor of the house-boat, so that we may be able to look down through the window, and see whatever submarine gardens may exist in the lakes, as we pass over them in them in the house-boat. It is probable that there are as beautiful submarine scenes to be observed here as on the Pacific Coast of California.

Sanitary disposal of Sewage Matter by Cremation .

Another recent work of this department has been the erection of a fire-proof concrete building beside the Aerodrome Company's Headquarters, known as "The Crematory", for experiments relating to the sanitary disposal of sewage matter by cremation. A blue print giving the plans of this building appears on p. 4; and a photograph of the building itself is shown on p. 5. Mr. Byrnes submits two reports concerning the results of recent experiments at the Crematory which are as follow:—

July 20: — The experimental Crematory was in use from July 10–20 a period of 10 days.

An examination of the contents by Dr. Bell and myself, July 20,

84

Sanitary Disposal sewage matter by Cremation PLAN OF CREMATO? AT BEINN BHREAGH BADDECK.

85

97 Taken 1909 July 31 1909 July 31 Crematory for the sanitary disposal of sewage matter by cremation.

86

before lighting fire, showed very little dessication, owing possibly to too constant use.

Upon lighting fire we found that dry brush as fuel burned too rapidly, the whole amount burning in about 20 minutes, and not entirely consuming the deposits, which remained smoldering for an hour or two.

A later examination showed the mass to be burned to an inoffensive black ash, excepting a very small center, thus showing that a slower fire would have consumed the whole.

There were no flies around the fire-pit, although fly- have not yet been provided. Possibly the place is too dark for them.

Under present conditions I recommend burning out once a week. CCB.

July 26: — In use six days. This experiment was similar to the July 20 one, but with better results. Things were such drier than on the fewer occasion; and the contents of the fire-pit were burned completely to ashes. Those were scraped out, and a fresh bed for fire made of spruce boughs, sticks etc. CCB.

Much of the dampness noticed in former experiments was undoubtedly due to rain getting down the chimney. This has now been remedied by a rain-guard. See photo p. 85, AGB.

87

Aug. 10 BALDWIN'S ACCOUNT OF SILVER-DART FLIGHTS .

Fort William, Aug. 3:— The good old “Silver-Dart is no more. Although she gave a convincing demonstration of the possibilities of the new motor before giving up her serial ghost, still it is hard to think of the old Dart as absolutely gone. Every Tommy in Camp has a souvenir splinter by this time.

The wreck was no uncertain one; and, besides losing our practice machine, a great deal of official faith probably went by the board.

We got up early yesterday morning (August 2) about four o'clock, and intended to make a few hops to satisfy ourselves that everything was O.K. Our intention was to first try out the balance, and then see if she would carry two.

The morning was perfectly still, and in a few minutes after getting her out of the shed, John made a flight of perhaps 1/4th mile, the engine working beautifully without any preliminary fussing .

The I rode back with John, and once more everything went well.

We then gave Willie Macdonald the opportunity of seeing what it felt like, and I'm very glad it was on that trip as it turned out.

The fourth and last trip was by far the steadiest flight. We came back about ½ mile and intended to land close to the shed.

88

John kept her about ten feet up on an average, just skimming the tops of the little rolling ridges.

The place we thought of landing on was a little sort of plateau on the top of one of these knolls. The Sun was low and shining brightly in our faces which made it harder for John to judge the elevation. Anyway, instead of landing just on top, the front wheel struck the face of the cliff. Rebounding like a shot the nose went away up, and then down, and we struck:—

It took us a little time to get out; and to poor Willie Macdonald, who was about a quarter of a mile behind 89 running his head off, it seemed an age until John waved.

The machine was crumpled and smashed in every conceivable way, except, strangely enough, the wheels, skids, and propeller.

The engine as far as we can judge was not hurt in the least. The low engine and chain-drive seem to me to have two distinct advantages in a smash. First of all it is much less likely to come through on

you; and second the crankshaft is not so likely to be sprung should the propeller strike hard as the chain reduces the shock.

John scraped his face, and will not be cursed by his fatal beauty for a week or two; and I got my leg under something that took some skin off. Otherwise we are intact, which I think is one more example of the fact that you have very good chances of coming out of the worst kind of a wreck with nothing more than scratches.

Work on Baddeck I is going along nicely, and unless something unforeseen keeps us back she should be ready by the end of the week.

You have no idea what a satisfaction it is to feel that we have a motor upon which we can rely. So far it has never refused for a moment. We are using an 18 to 30 gear, on a 7 ¼ inch propeller, with something like an 8 foot pitch.

With this load the engine turns over 1400 rpm. standing, which gives the propeller 840 rpm. This is about 100 revolutions better than the old engine could turn it, and checks out our expectation of 40 actual brake horse power.

90

The lubricating system is self-contained, simple and efficient, which leaves us with only the cooling problem to contend with. How this will be we cannot yet tell, but as the motor does cool in a motor-car, we should be able to cool it in an aerodrome, especially as our last radiator design should not be a drag on the machine.

I am very anxious to hear how the Oionos-Query combination is coming along. John said that you were thinking of getting one of these Kirkcham motors, if ours proved satisfactory.

In that case it would be a good scheme to send the 6 cylinder back to Glenn, who should be glad to get it. With new cylinders after his new pattern it would be a very handy motor to have.

Thank you very much for the portfolio with the notes. (The Beinn Bhreagh Recorder) I enjoyed reading them. The discussion especially made me feel quite homesick. etc.

(Signed) Casey.

91

Aug.11, EFFICIENCY VERSUS STABILITY: BY A.G. Bell.

Man has been experimenting with flying-machines for a few years past; nature, for countless ages: And it is interesting to observe that the Drome is gradually approaching the bird-form in many respects.

I have already alluded to the growing tendency to discard vertical surfaces; and to the success of the single-surface type of machine in the hands of Bleriot and Latham. (See pp. 17-20, 41-46).

The progress of Aviation has developed another point of similarity:— Aviators now generally employ curved supporting surfaces, instead of aeroplanes. So do the birds; and, in both cases, the concavities are underneath.

Now we have many experiments that indicate that aero-curves, concave below, are less stable in the air than when the concavities are above; and that aeroplanes, or flat surfaces, occupy an intermediate position in this respect:— So that both in the case of the Drome and the bird, the most unstable form of surface seems to have been preferred.

Why should this be when stability is of so much consequence to the aviator in the air?

The efficiency of an aero-curve concave below is greater than when the concavity is above; while in this respect the aeroplane occupies an intermediate position. The more unstable device has therefore undoubtedly been adopted 92 because of its greater efficiency as a supporting surface. It has greater lift relatively to its drift. In other words, with a given thrust of a propeller, a surface will support a greater weight in the air if it is concave beneath than if it is flat or concave above.

It is somewhat remarkable that those arrangements which yield the greatest lift seem to possess the least stability in the air; and iv vi ce versa . For example, a winged tetrahedral cell with its concavity above, has considerable stability but poor lifting power. Turn it upside down, and it has good lifting power with poor stability.

In fact, as a general proposition, efficiency and stability seem to be in inverse ratios to one another. We gain efficiency at the expense of stability: We gain stability at the expense of efficiency: And, both in the case of aviators and birds, efficiency seems to have been preferred to stability. Stability, gained by skill in the use of moveable surfaces, has been preferred to inherent stability as a property of the machine itself.

I think this sacrifice of inherent stability to efficiency of support arises from economy of motive power. Given a poor motive power, and then of course it is of all things necessary that we should have surfaces of sufficient efficiency to support our machine in the air: But, as we gain speed in the air, the efficiency of the supporting surfaces becomes perhaps of less importance, for with very high speeds almost anything will fly. In projectile flight no supporting surfaces at all are required. Wings would only retard an arrow in its flight: It would fly better without them than with them.

Supporting surfaces, and automatic stability, are both more needed in a low-speed than a high-speed machine: But engines will break down in the air; and, in any case, the aviator must land. The less supporting surface he has, and the more unstable his machine, the more disastrous the conclusion of his flight may be.

Even a bird, when disabled in the air falls to the ground like a mass of lead. Do we want to have this happen to our machines? A.G.B.

94

Aug.12 PIN-PRICKS AT PETEWAWA.

August 12: — McCurdy and Baldwin are evidently having trouble in Petewawa in getting the Baddeck No.1 in condition to fly. A telegram from McCurdy, August 7, announced his intention of making a trial flight that afternoon, but nothing seems to have transpired since then.

A telegram received yesterday by Ingraham throws light upon some of the causes of delay. McCurdy says:—

Petewawa, August 11: — Put turnbuckles on both ends wire between surfaces, also spoke terminal on all wires exposed. Don't thread wires themselves for vibration breaks them at nipple. Not enough play.

(Signed) J.A.D. McCurdy.

They are evidently experiencing difficulties from powerful sympathetic vibrations set up in their struts and wires by the shaking of the machine under the influence of the new engine and propeller.

This is a serious matter and I thought it well last night (August 11) to send McCurdy the following suggestions concerning the prevention of sympathetic vibration in struts and wires.

REMEDY FOR SYMPATHETIC VIBRATION

(A suggestion to McCurdy from A.G. Bell)

August 11: — Your telegram to Ingraham shows you are having trouble with vibrating wires. This is undoubtedly a case of “sympathetic vibration” caused by periodic 95 disturbances propagated from the engine and propeller.

The theoretical remedy is clear:— Clamp your wire near, but not quite at, its middle point, so as to divide the wire into two unequal vibratory segments. One of the segments will then have a different rate of vibration from the other and the wire as a whole should be incapable of sympathetic vibration.

The principle is:— Divide you vibratory body into two parts having normally different rates of vibration discordant with one another, then the vibrations induced in one of the segments will tend to check and neutralize those in the other.

You can do this by ex-centric clamping or damping; or by central clamping with a load upon one of the segments to change its rate of vibration. The same principle is applicable to struts.

Casey's Baldwin's method of guy-wiring a strut to prevent lateral deflection, would afford a perfect remedy against dangerous vibrations, if the attachment of the guy-wire is made, not at the middle point of the strut, but at a point near to it; so as to divide the strut into two unequal vibratory sections having normal rates of vibration of nearly, but not quite, the same frequency.

Suppose you pluck a tense wire with your fingers so as to make it produce a musical tone: This is its “fundamental” or “proper” tone.

Now clamp the wire firmly at its middle point, and it is no longer capable of producing its fundamental tone; but 96 each half of the wire, when plucked, will produce a tone an octave higher than the fundamental. In this case the tone produced by one-half of the wire will be of the same pitch as that produced by the other half. This is a condition we want to avoid. They should be of slightly different pitch, so as to produce tones that are discordant with one another. Then the whole arrangement will be incapable of sympathetic vibration.

The wire may still be thrown into slight vibration by shocks or blows, but the amplitude of vibration can never be great; for the impulses transmitted from one vibrating section to the other tend to check and neutralize the vibrations existing there.

If you take an ordinary tuning fork and strike it against a table the shock will set it in vibration, and it will produce a musical tone which will continue sounding for quite a long time; just as a bell continues sounding for a long time after you strike it.

Now if the two prongs of the fork are of unequal length, or if one is loaded (say with a bit of wax), the fork is technically "dead", producing only a sound like a cracked ball which will not continue for any length of time after the initial blow is struck.

Only those arrangements that continue in vibration after being struck once, are liable to be thrown into vigorous vibration by the action of periodical impulses transmitted from other bodies, like engines and propellers.

97

I believe there is an important principle here of the greatest importance in aerodrome construction. If you have a copy of the Bulletins of the A.E.A., in Petewawa, read what I have said in Bulletin XXXVI, pp 6-8, about the sympathetic vibration of struts and wires.

Here is an experiment for you that may show whether there is or is not, any importance in these ideas.

Make a loop of wire, and tie up a pair of diagonal wires so that they do not cross at the central point c . Then the segment a will be longer than b ; and the segment d longer than e .

Now start up your engine, and compare the vibrations produced in the diagonals, with those produced in the other diagonals of the machine. We can't very well try it here for lack of a powerful engine and propeller to give the whole thing a good vigorous shake.

(Signed) Alexander Graham Bell.

98

EXTRACTS FROM BALDWIN'S LETTERS. Aug. 4, 6, 7

August 4: —Work on Baddeck I is progressing very nicely indeed. The center section is pretty well up today, and the left wing.

There is no question about it, that the new one is a tremendous improvement over the Dart in construction and cleanness of design, and unless our curves are very bad indeed should carry a better load and be capable of making better speed than the Dart.

Our idea has always been to have a little reserve power, and it would seem as if we were actually going to have it in this machine. Etc. F. W. B.

August 6: —Baddeck No. I is coming along nicely and by Saturday will be all ready.

The newspaper men are not taking any chances on missing a flight and are practically camping on the grounds. Two of them had inside information that we were going to try her at dawn, and so slept in a freight shed which is near the calvary field.

Another wise man from Pembroke had the same information only, according to him, we were going to cross the Ottawa River. Accordingly he brought a large party up in his launch a distance of about fifteen miles, and spent most of the night and early morning cruising up and down.

Everybody is tremendously interested. If we can make good flights with Baddeck No. I, the Silver-Dart episode will 99 be forgotten as an accident, and remembered only as an entirely satisfactory test of the new motor. Earl Gray sent us a very nice telegram from Glacier Mountain (Mr. Baldwin neglected to enclose a copy for the BB Recorder. AGB).***FWB

August 7: —We have no intention of trying to see what the machine is capable of, for some time, until we got thoroughly familiar both with the machine and the grounds.

Flying over this undulating ground is a very different proposition from the ice, or level field. A landing can be effected anywhere on the ground if necessary, but some parts are much better than others, and we cannot afford to take any chances. From our brief experience of making a landing not perfectly judged, on uneven ground, the danger seems to be on the rebound, which is almost certain to be erratic.

The Toronto News had a little jest on me to the effect that while they always understood me to be temperate, there was reason to believe that I took a drop too much at Petewawa. Kan (Mrs. Baldwin) was very much annoyed when she heard of it, and was on the point of writing an indignant letter to the Editor when the joke dawned on her. ***

(Signed) F. W. Baldwin.

100

LIBRARY OF ALEXANDER GRAHAM BELL

The Canadian Beaver: —“Fly ahead you fellows, I'll catch up with you.” Echoes of the Silver-Dart disaster. Photo by J. McNeil of a cartoon in the Toronto News of Aug. 4.

101

Master Alexander Graham Bell Fairchild, and his cousin Miss Lilian Waters Grosvenor on the lawn at the Point. Photo by Gilbert H. Grosvenor.

102

Master Alexander Graham Bell Fairchild, and his cousin Miss Lilian Waters Grosvenor leaving the lawn at Beinn Bhreagh Hall. Photo by Gilbert H. Grosvenor.

103

1909, Aug. 13

First attempt to fly across British Channel, July 19. Latham starts for his daring dash over the edge of a high cliff at Sangatte, France. Photo copied by J. McNeil from “Zeitschrift fur Luftschiffahrt” for July 28.

The dash over the cliff. The machine safely in the air above the British Channel and headed for England. Photo copied by J. McNeil from the same journal.

104

End of first attempt to fly across the Channel. Machine floating on the surface of the sea, with Latham in his seat, calmly smoking a cigarette, and waiting for help. Photo copied by J. McNeil from above German periodical.

Preparing to hoist Latham's machine on board a French torpedo boat. Photo copied by J. McNeil from above German periodical.

105

Rear view of the Bleriot XI. monoplane making its 25-mile cross-country flight. This is the same machine which, 12 days later, on July 25th, accomplished the record-breaking feat of flying across the English Channel in 37 minutes. The single-surface aerodrome in which Bleriot successfully flew

across the British Channel July 25. Photo copied by J. McNeil from the Scientific American for August 7.

106

BADDECK NO. I TAKES THE AIR. Aug. 12, 1909.

Aug. 13: — A night message from McCurdy, received this morning, announces that the aerodrome "Baddeck No. I" successfully took the air yesterday afternoon (Aug. 12) at Potowawa, Ontario. In this telegram Mr. McCurdy says:—

Petewawa. Aug. 12: — Baddeck No. I made successful jump this afternoon about one hundred yards. Control sensitive. Action good. Power plant satisfactory. Complete staff from Ottawa here. Took your advice. Will try jump again to-morrow.

(Signed) J.A.D. McCurdy.

The following congratulatory telegrams were sent today (Aug. 13) to McCurdy and Baldwin at Petewawa:—

Aug. 13: — Heartiest congratulations for first flight Baddeck No. I from Canadian Aerodrome Companys' staff.

(Signed) K. Ingraham.

Aug. 13: —Heartiest congratulations on first flight of Baddeck No. I from the Beinn Bhreagh Laboratory staff. Please make a record flight.

(Signed) W. F. Bedwin.

Aug. 13: — There is no finer dro?e in the world to-day than Baddeck No. I. Go slow with her, and make only short flights till you have thoroughly learned the feel of the controls. Don't play to the crowd by anything sensational. Many short practice flights should be made before you even attempt to show the capabilities of your machine, which are undoubtedly great. Congratulations on a successful beginning yesterday.

(Signed) Graham Bell.

107

1909, Aug.14

Aug. 13: — Impossible to keep you down. Good luck to Baddeck No. I. (Signed) John G. Davidson.

Baddeck sends greeting

Aug. 13: — Citizens of Baddeck salute their Aerial numesako. (Signed) Percy Blanchard Sec. of Board of Commissioners

REPORT OF B. B. NURSERY by John G. Davidson, Supt.

The season of 1909 has been a very busy one at Beinn Bhreagh Nursery. The spring opened up early, although it kept very backward and cold, occasionally getting a few fine days that were tempting to try seeds in the ground, although we know well severe frosts were liable to come that might have disastrous effects. Still every year so have to take such risks as losing our first sowing of all kinds of vegetables by frost, or seed rotting in the ground on account of ground being too cold.

This year we were fortunate not to get the late severe frosts we anticipated and so were able to have peas, spinach, etc., much earlier than last year.

The month of June was comparatively fine; so fine and warm that we completed bedding out annual flowers and vegetables by June 28, whereas in former years we have had tomatoes cut back by frost June 24.

This season the orchard, both young and old trees, was the prettiest sight I have yet witnessed on Beinn Bhreagh. 108 Apple, Pear, and Plum trees were all one solid mass of blossom. Even a young scion I grafted on to a tree in the Spring of 1907 of the Blenheim Pippin variety, bore its share of blossom although not more than eighteen inches in height. Although it will not be allowed to form fruit this year, I hope it may continue to show its fruitful signs each year. I am pleased to state we have this year a heavier crop of Apples and Plums than in any previous year.

It is noteworthy, while writing on fruit, there is one tree in the orchard I have been fighting the black-knot on, for the past eight years, each year cutting off, and cutting pieces out of limbs to save it. This year it has shown its determination to go to the bad as most every twig is literally covered with black-

knot. So it will receive the fatal blow this fall before the apores commence to fly with the autumn winds.

There have also been additional flower and shrub beds made, which have been thoroughly trenched over to a depth of two and a half feet, and good soil put in. This should insure good results in future.

The flowers have all done well so far this summer; and through the generosity of Mrs. Bell many homes, besides churches, public Library, and Hotels in Baddeck, have been decorated with them, and a great many visitors have appreciated highly the opportunity afforded them of seeing around the grounds.

The roses on the pergola walk are exceptionally fine this summer; but it is with a feeling of regret I look along 109 and see the many spots where roses were planted, but killed by our severe winters, and have to be filled up by some other vine where the rose should have adorned every pillar in this walk.

Potatoes, Turnips, Mangles, Sugar Beans, etc., all have a promising appearance. Peas, first and second sowings, were exceptionally fine. Third, fourth and fifth successive sowings of the wrinkled variety of peas are exceptionally poor. Fully 85% of the seeds rotted in the ground, the result of poor seed. I observed the poor quality of these seeds when sowing, and so put in a double quantity of seed, but the result of the sowing was so poor that this year for the first time, I had to send for a second supply of seeds.

I wrote the firm from whom I purchased, about the failure of their seeds; and the reply I received was a present of a five pound bag of peas sent me post paid.

Carrots made a fine all round start, but those in the orchard the maggot got after them, and completely destroyed them from end to end of the lines.

During this late dry spell part of the lawns looked as if they were burned up, although sprinklers were going. On examination I found the roots of the grass all cut by a grub, the same species of cut worm which in the year 1896 completely ruined some of the finest lawns, in and around Boston mass.

There was also considerable work done in grading and making up of flower beds around the new cottage known as 110 Mr. Baldwin's Bungalow, and some new flower beds were made at Beinn Bhreagh Lodge and Panay Cottage for Mr. and Mrs. Gilbert H. Grosvenor.

A hawthorn hedge, started last fall, was completed thin Spring along the side of the fence of the front lawn at BB Hall. On this hedge it is very interesting to note the difference between Fall and Spring planting, the Spring planting being so superior. Fall planting is indulged in because of more time being available than in the Spring of the year when everything is rush, rush.

A new flag-pole was erected this Spring at Beinn Bhreagh Hall. Beinn Bhreagh forests were first searched for a suitable tree for this purpose, but we failed to secure anything coming near the height desired. Many offers were received from outside to supply a tree of the dimensions required for this purpose; and many trees were felled, but alas when measured were found to be too short. Finally one was secured at or near St. Anns which stands 65 feet 4 inches in height. A new butt of pin? was put down. The butt is set in concrete same as the old one, about seven feet in the ground; and the flagstaff is set in two feet of concrete above ground and strengthened by bolts and band; also leaded around at the surface to prevent decay. A pulley was also placed in the ball on top, which makes it much easier to hoist the large flag, also a saving on the rope.

The names of the men employed by Beinn Bhreagh Nursery end of July, were:— Francis J. May, Donald McIver, Thomas 111 Roberts, Edward Dart, and James Stanton.

(Signed) J.G. Davidson, Supt.

THE FLOWER GARDEN AT B.B. HALL

Mr. Davidson is justly very proud of the flower garden at Beinn Bhreagh Hall, which is under his charge as Superintendent of Beinn Bhreagh Nursery.

Certainly the flower garden has never before presented so beautiful an appearance. Unfortunately, flowers die and beauty passes away. And it has always seemed a pity that some permanent record could not be preserved of the beauty of this place in the summer months.

Through the kindness of Mr. Gilbert H. Grosvenor, I am able this season to place in the Recorder a series of fine photographs showing the condition of the flower garden in July 1909. These will serve as a feeble reminder of the flower garden at its best; although, of course, the photographs do not show the colors that lend so much charm to the scene.

Mr. Davidson's descriptions of the enthusiasm of visitors to Beinn Bhreagh Nursery may seem to some to be overdrawn; and are apt to be taken cum grano salis, from a feeling that Mr. Davidson knows very well how to blow his own trumpet. The photographs, however, will show that he has

good reason to be proud of his work; and that the flower garden in July is really a thing of beauty, well calculated to evoke expressions of admiration from all who see it. (see pp 112–116) AGB

112

The pergola in Mrs. Bell's flower garden, which is under the charge of Beinn Bhreagh Nursery. Mr. Davidson's house in the distance. Photo by Gilbert H. Grosvenor.

View of the flagstaff and sundial from Beinn Bhreagh Hall. Photo by Gilbert H. Grosvenor.

113

Portion of flower garden and Beinn Bhreagh Nursery. Mr. Davidson's house and the sheep barns in the background. The pergola in the middle. Photo by Gilbert H. Grosvenor.

A portion of the flower garden. Entrance to pergola on the left. Photo by Gilbert H. Grosvenor.

114

View of Beinn Bhreagh Hall from the flower garden. Photo by Gilbert H. Grosvenor.

Beinn Bhreagh Hall as seen from the pergola. Photo by Gilbert H. Grosvenor.

115

The roses in the pergola July 1909. Photo by Gilbert H. Grosvenor.

Portion of garden at the Point showing the profusion of flowers in July 1909. Photo by Gilbert H. Grosvenor.

116

Mrs. Bell in her flower garden. Photo by Gilbert H. Grosvenor.

Puzzle picture. Mrs. Bell among her flowers. Where is Mrs. Bell? Photo by Gilbert H. Grosvenor.

117

SECOND FLIGHT OF BADDECK NO.1 August 13, 1909.

August 14: — The following night message from Baldwin and McCurdy was received here this morning:—

August 13: — In trial this evening machine proved tail heavy, and slid down backward after travelling two hundred feet, breaking running gear, and rear of bottom surface. Nobody injured.

(Signed) Baldwin and McCurdy.

The telegram simply shows that the machine has not yet been properly balanced:— The defect is easily remedied.

It is inevitable that much time should be consumed in testing out any new machine like this; and it is only unfortunate that at Potowawa, these preliminary experiments have to be made in the presence of important visitors. It seems a pity that all the necessary preliminary fussing over details should not have been made here rather than at Potowawa, on account of the impression created in the minds of spectators who know nothing about aerodromes.

The Baddeck No. I is probably the finest aerodrome ever constructed; and there can be no doubt that after a few days of experiment to ascertain and remedy the little defects of adjustment that are always found at first in new machines, the Baddeck No. I will make good flights, and be recognized as one of the great machines of the world.

Meanwhile Baldwin and McCurdy have our sympathy for the trying conditions under which they have to make their preliminary tests.

118

We may repeat to Baldwin and McCurdy as our own, the sentiment so well expressed to them yesterday by Mr. Davidson:—

“Impossible to keep you down. Good luck to Baddeck No. I”.

AGB

LABORATORY NOTES By Wm. F. Bedwin, Supt.

Aug. 9: — Took Mr. Watson on the Laboratory staff today.

Aug. 10: — Making good programs with half-sized model of the proposed Oionos aerodrome. The center frame for the middle surface is completed; and materials are all made for the framework of the top and bottom surfaces. The strut material is also ready.

Think that white nainsook will make a good material to cover in with, being considerably lighter than the sail silk.

The front and rear chords have been perforated to reduce their weight without reducing their strength.

We are putting a very small aluminum back edge to stretch the fabric over, and will sew the front edge, and cover with a nose.

Aug. 11: — Experiments were made to-day with the model of Cygnet II on the bay. Got ten sets of ten readings each, of altitude and pull; and ten readings of wind velocity.

119

Aug. 12: — The new upside-down kite of pure tetrahedral construction has been completed for some time. It was taken up to the kite field to-day for a trial; the wind however was so weak and fluctuating that it was thought best not to risk injuring the kite. Although we could probably have got her up, it was a little doubtful about the coming down. The kite was therefore returned to the Silver-Dart shed until a more suitable opportunity for an experiment presents itself.

Aug. 12: — The center surface of the half-sized model of the Oionos drome will measure 114 cm × 533.4 cm. Weight of framework 2670 gms.

Aug. 13: — Made ten sets of experiments with half-sized Cygnet model on the bay to-day.

Aug. 13: — Sent telegram from the Laboratory staff to McCurdy and Baldwin at Petewawa congratulating them on their success in getting into the air yesterday with Baddeck No. I

WFB.

NOTE FROM AERODRONE COMPANY. By K. Ingraham.

Aug. 10: — I am pleased to report that Baddeck No. 2 is getting assembled in good shape, and we are not running against any snags of any description. Everything is going together in first class style.

120

We will have her in such shape within a few days that we will be able to show our visitors something that they will know is a flying-machine after looking it over with a little information.

Mr. Rudderham, who has been in North Sydney for some time, will be back to work within a few days.

KI.

BEINN BHREAGH ITEMS. Aug. 7-14.

Aug. 7: — The acetylene lights at Beinn Bhreagh Hall have been working poorly for a few days past, and to-night about nine o'clock they went out altogether leaving us in darkness. Investigation showed a stoppage in the supply pipe. The obstruction was soon cleared out and the lights burn better than ever now. AGB.

Aug. 9: — The motor boat Randolph has undergone extensive repairs, there being three people at work on her, working almost night and day. Her Capt. and owner are making strenuous efforts to win the Cup. WFB.

Aug. 9: — Rev. James Lumsden, Pastor of the Methodist Church, Baddeck, and his son Ronald visited B B Nursery. Mr. Lumsden is anxious to have his son, who for the past two years has been in the employ of the Bank of Nova Scotia, at Amherst, N. S., initiated into agriculture and horticulture, as he is soon to take a College course in this line at the Provincial College, Truro, N. S. JCD.

Aug. 10: — First appearance on Beinn Bhreagh of a completely closed-in carriage. This is a carriage imported from Boston. Mrs. Bell need no longer get wet, when she drives out in rainy weather. AGB.

Aug. 10: — The handicap motor boat races are still on, and will be kept up until some one boat has three wins. The timing of boats is changed after every race in the endeavor to get as close a finish as possible. As things stand now the following boats have one win to their credit Randolph, Qui Vive, Sworm. The races in future will be held in the evenings to avoid any lost time to the owners. The Lusitania did not get started in the last race owing to some difficulty with the motor. WFB.

Aug. 10: — Dan Morrison of RedHead was at BB Nursery to-day, looking for a share of the sheep that were recently being distributed, but was too late for this years distribution, but wants to have his name on the list for the use of one of the BB Nursery rams this Fall.

Mr. James Manuel has also applied for the use of a ran this Fall. Glad to notice that the Red Head farmers are seeing BB sheep in a new light, and are applying early so as not to be disappointed. JCD.

Aug. 10: — Mr. Angus McInnis, Brookside Farm, Big Baddeck, telephoned to-day that he was out looking for sheep recently received from BB Nursery. He says they are 122 too smart for his fences, and have got clear. He expects they are making their way back here, although it may be some time are they reach Beinn Bhreagh. He requests Mr. John McDermid to telephone to McKay's store in Baddeck if he should see them on the road beyond the entrance gate of Beinn Bhreagh. JCD.

The Capt. of the Gauldrie knows how to swim.

Aug. 11: — Capt. Murdock McDonald, while shoving off the Gauldrie from the "Get-Away", got away himself. He gave a fine exhibition of his swimming powers which was much admired by the Laboratory crowd. By the vigorous application of his lateral rudders he succeeded in keeping right-side up, although his long rubber boots interfered somewhat with his fore-and-aft stability. WFB.

Aug. 12: — List of visitors registered at BB Laboratory. Aug. 2, Gilbert H. Grosvenor of Beinn Bhreagh; Aug. 6, Albert M. MacLeod, and W. A. Fitch, of Sydney; Aug. 10, P. L. MacFarlane of Baddeck; Aug. 11, Capt. Thomas F. Moore of North Sydney. WFB.

Aug. 12: — William Stewart and Angus McKillop have been doing quite a lot of crowing lately about their Quoit throwing. J MacLean went out at noon yesterday, and beat them both together, by a score of 15 to 21. WFB.

Aug. 12: — Steam Tug "Alexandra", which has been delayed at Baddeck with a scow load of Lumber, on account of 123 the storm, came over to the Laboratory wharf this morning, and Capt. Thomas F. Moore asked me if he could get a tank full of water. We allowed him to connect up the pipes we laid to the wharf to supply the "J.A. McCoah", and he filled up with water. WFB.

Filled up with Water, and a drop too much.

Aug. 12: — Bedwin's remark that Capt. Moore "filled up with water" reminds me of a joke recently on Miss Georgina McCurdy, the great advocate of temperance in Baddeck. She was horrified to be told, very confidentially and secretly that her nephew, Douglas McCurdy, on the day of his accident at Petewawa, "had a drop too much".

It was some time before she could see the joke. AGB.

Aug. 12: — Jim McKenzie left for North River to get a girl for Mrs. Bell.

Aug. 13: —Mrs. James Dunlop of Baddeck, and Mrs. Bennett of Regina, Saskatchewan, visited?B Nursery, and afterwards dined with Dr. and Mrs. Bell at Beinn Bhreagh Hall. Mrs. Bennett is a sister of Jim and Dave Dunlop, a and Mrs. Maud McKenzie. She was born in Baddeck, but has not visited her native place for over 20 years. She is an authoress, and writer for the Press. JGD.

Aug. 13:— Miss Christine McLellan and Miss Anna Urquhart spent the evening with Miss Etta Jackson at Baddeck:— Escort? A. Bingay, and P. Manchester.

124

Aug. 13: — Miss Sarah McDonald, and Miss Annie McDonald went to town this evening and visited Miss Campbell's Ice Cream Parlors:— Escorts, Mr. Jack McIver, and Capt. Murdock McDonald. XYZ.

Aug. 14: — Miss Mary Campbell of Warhabuck has been spending a few days at Beinn Bhreagh visiting her Aunt Miss Maggie Campbell, who was injured by a fall a few days ago. She returned home to-day. Mr. A. Bingay, Mr. J. McIvor, Mr. A. Smith, Mr. Percy Manchester, and Capt. M. McDonald are frequent visitors at the Point to enquire after the health of Miss Maggie Campbell. XYZ.

Aug. 14: — Mr. Jim McKenzie has returned to Beinn Bhreagh with Miss Grace Nichols of North Shore, who will work for Mrs. Bell. He reports his family at North River as all well. His boy has quite recovered from his recent accident. AGB.

125

1909, Aug. 16, Laboratory Challenge Accepted.

Aug. 14: — The Laboratory challenge to a game of Quoits (p. 25) is accepted by the Canadian Aerodrome Co. Wednesday, Aug. 18, preferred if convenient. KI.

LIST OF EXPERIMENTS AUG. 7-14.

Aug. 11:— Model of Cygnet II on the bay. 10 sets of observations.

Aug. 12:— Preliminary experiments on the kite field with a new upside-down kite of pure tetrahedral construction.

Aug. 13:— Model of Cygnet II on the bay. 10 sets of observations.

Aug. 14:— Model of Cygnet II on the bay. Ten sets of observations.

AGB.

126

THE CAUSE OF THE ACCIDENT TO BADDECK NO. I. By A G Bell.

Aug. 16: — Upon reflection, I am unwilling to accept the explanation of the accident to Baddeck No. I given by the newspapers, and by McCurdy himself viz., that the machine was “tail-heavy” (see p. 117).

Both Baldwin and McCurdy are experienced men, and would not be likely to make the radical mistake of balancing their machine in this way. They have always been careful in the past to put the center of gravity forward rather than back. They certainly would not have attempted a flight, unless they had previously satisfied themselves, by experiment and by calculation, that the machine was properly balanced. That is:— That it was slightly head-heavy to begin with. To suppose otherwise would be to cast a reflection upon their abilities as aerodrome constructors and engineers.

Before starting out therefore, they made such experiments as they could, to test the balance of the machine on the ground, and came to the conclusion that the Baddeck No. I was not tail-heavy in the slightest degree. Otherwise they would not have attempted a flight.

McCurdy is now inclined to think that this conclusion was erroneous, because when the machine was tried, it turned stern down, and dived backwards to the ground; but this is by no means certain.

127

If the stern turned down, the head of course, turned up; and the effect might have been produced either by excessive weight at the stern, or by too much lifting power at the bow.

I am satisfied, from my personal knowledge of the competence of both Baldwin and McCurdy, that there was NOT excessive weight at the stern; and therefore look to the front control for the cause of the turning movement.

Here we are met by the fact that the front control contained a new feature in aerodrome construction, not hitherto tried, so far as I am aware, in any machine:— The surfaces of the front

control were curved, like the main supporting-surfaces of the machine. In former machines they were flat.

Theoretically this should increase their lifting power when turned at a positive angle; and diminish their depressing power when set at an negative angle.

I anticipate therefore, that when McCurdy steered up with his front control, a greater effect was produced than with an equal movement of the Silver-Dart's control; and when he steered down, a less effect.

Now suppose the machine to be climbing to an alarming degree, not justified by McCurdy's previous experience with the Silver-Dart, what would he do? Naturally he would try to correct the climb by steering down.

Then he would probably discover that a depression of the front control, which would have been quite sufficient 128 with the Silver-Dart, failed to bring the head down; and all he could do would be to depress the control still more.

But all this time the headway of the machine would be diminishing because of the climb up hill; so that from this cause alone, quite irrespectively of the form of the control, the ability to steer down would be diminished as headway was lost.

Headway is always less in going up hill than in coming down, so that a rudder will always work better on the down grade than the up. This suggests the advisability of giving a front control more steering power when correcting a climb than a dive. Curved surfaces, with their concavities above might accomplish this result; but in Baddeck No.I the concavities are below.

This arrangement seems also to be disadvantageous when the machine slides down backwards towards the ground. Under headway the curved surfaces steer the head up better than down. Under sternway they steer the stern down better than up.

Imagine the Baddeck No.I at the highest point of its head tilted up at a dangerous angle. The cop for the engine to climb, and McCurdy the front control in a vain attempt to steer (I say "vain" because headway has been lost, no rudder will steer).

the inevitable slide backwards down hill. by sternway, and the front control acts 129 as a tail. Unless McCurdy instantly reverses the position of his front control all is lost.

Under stern-way the depressed control will steer the stern down still more; and this steering action will be increased and intensified by the fact that the concave surfaces are then presented to the wind of backward advance. Nothing can save him, but the elevation of the control so as to steer the stern up; but in doing this the control presents its convex surfaces to the wind of backward advance, so that it has less effect in correcting the backward dive, than if the surfaces were flat, or curved with the concavities above.

I am very much afraid that the front control of Baddeck No.I constitutes a dangerous innovation upon established practice, increasing the danger to the aviator and the machine.

If we must depart at all from established usage let us go in the opposite direction from this. Turn the whole thing upside-down, with the concavities above instead of below.

After considering the behavior of Baddeck No.I during the accident of Aug. 13, I have come to the conclusion that the curved surfaces of the front control were perfectly capable of producing the effects observed, especially in the hands of an aviator inexperienced in their use, and accustomed to a different form of control.

I take no stock in the "tail-heavy" theory; for 130 Baldwin and McCurdy had previously examined the machine on the ground with this special point in view, and had decided that the balance was O.K.

Let us look to our front controls. AGB.

131

1909, Aug.17 KITE DATA AUG.11-14.

Aug.17: — I give on p.132 the data secured with the half-sized model of Cygnet II, Aug.11, Aug.13, and Aug.14. The following are Mr. Bedwin's field notes relating to these experiments:—

Aug.11:— In taking kite down when strain was on bow-line the kite turned completely over and flew that way for a few seconds. We slacked up on bow-line, and she righted herself before strain came on flying-line. We then succeeded in getting the flying-line to the Get-Away, and got kite back on arms with no damage to structure whatever. WFB.

Aug.13:— Everything went fine. Not a hitch in the whole experiments except one lull in wind for a moment, but kite recovered herself before getting dangerously near water. Landed kite back on Get-Away arms. WFB.

Aug.14:—Everything in experiments went like clock-work. Brought kite back on Get-Away arms without breaking a single stick. WFB.

I am rather concerned about the lack of stability displayed by this kite Aug.11. This is not the first time the kite has acted in this way; and I remember that the original model "Kite C", which led to the adoption of the Cygnet II form of structure acted in a similar way on July 11, 1908. See Bulletin IV p.8, also remarks on p.40. AGB.

132

MODEL OF CYGNET II. Aug.11-14.

736 winged cells. Surface 39.9 sq. m. oblique. Weight 27.240 kg., or 60.0 lbs. Weight of rope 4.852 kg., or 10.7 lbs. Weight of cord 1.053 kg., or 2.3 lbs.

Conditions Observations Date Exp FL BL Wind Pull Altitude Aug 11 1 r100 c200 23.00 mph 27.8 kg 20°.8 Aug 11 2 r100 c200 23.60 mph 28.0 kg 20°.2 Aug.11 3 r100 c200 23.00 mph 23.9 kg 21°.7 Aug 11 4 r100 c200 24.40 mph 25.6 kg 22°.2 Aug 11 5 r100 c200 24.20 mph 34.0 kg 21°.4 Aug 11 6 r100 c200 23.60 mph 2°.4 kg 20°.2 Aug 11 7 r100 c200 23.40 mph 27.8 kg 22°.4 Aug 11 8 r100 c200 23.00 mph 29.6 kg 23°.7 Aug 11 9 r100 c200 23.60 mph 32.0 kg 21°.4 Aug 11 10 r100 c200 23.40 mph 32.4 kg 23°.0 Aug 13 1 r100 c200 17.00 mph 10.4 kg 12°.8 Aug 13 2 r100 c200 16.00 mph 9.4 kg 11°.3 Aug 13 3 r100 c200 16.70 mph 11.4 kg 14°.3 Aug 13 4 r100 c200 18.10 mph 10.3 kg 14°.9 Aug 13 5 r100 c200 17.70 mph 11.6 kg 17°.9 Aug 13 6 r100 c200 17.40 mph 11.0 kg 17°.0 Aug 13 7 r100 c200 17.40 mph 10.9 kg 16°.6 Aug 13 8 r100 c200 16.80 mph 11.2 kg 14°.3 Aug 13 9 r100 c200 17.00 mph 10.9 kg 16°.4 Aug 13 10 r100 c200 16.30 mph 11.2 kg 17°.3 Aug 14 1 r100 c200 17.00 mph 13.2 kg 18°.3 Aug 14 2 r100 c200 18.00 mph 12.3 kg 18°.5 Aug 14 3 r100 c200 18.00 mph 13.8 kg 19°.6 Aug 14 4 r100 c200 18.80 mph 15.8 kg 20°.1 Aug 14 5 r100 c200 18.80 mph 16.9 kg 21°.3 Aug 14 6 r100 c200 18.60 mph 16.3 kg 20°.8 Aug 14 7 r100 c200 19.80 mph 16.9 kg 20°.8 Aug 14 8 r100 c200 20.25 mph 16.0 kg 20°.7 Aug 14 9 r100 c200 18.80 mph 16.1 kg 19°.8 Aug 14 10 r100 c200 19.25 mph 15.4 kg 20°.3

Each observation of altitude and pull is the mean of 10 readings. For contractions see p.54.

133

ANEMOMETER RULES.

Aug.16:— All our anemometers register the number of feet of wind passing the instrument during the time observed.

To get miles per hour: — Allow the anemometer to run for 68 seconds, and note the number of feet registered. Divide this by 100 and call the answer miles per hour. Example:— 1120 ft. in 68 seconds equals 11.20 miles per hour.

(1) No of ft. in 68 sec./100= No of miles per hour.

To get kilometers per hour: — Allow the anemometer to run for 110 seconds (1 minute and 50 seconds) and note the number of ft. registered. Divide by 100 and call the answer kilometers per hour. Example:— 1120 ft. in 110 seconds equals 11.20 kilometers per hour.

(2) No of ft. in 110 sec/100 = No of kilometers per hour

The second rule is based upon the fact that a speed of 1 kilometer per hour is equivalent to 10 ft. in 11 seconds. (more exactly 10.025 ft. in 11 seconds). AGB.

134

1909, Aug.18, MULTI-NIPPLED SHEEP AT BB NURSERY. Aug. 17, 1909.

Name of sheep Description Ear mark B w m f 6 7 8 s t D H 1505 B f 6 s 1 1606 w f 6 t 34 1706 B f 6 s 4 1734 w f 7 s 47 17A w m 6 t 2 17B w f 6 t 48 1805 w f 6 t 24 1814 w m 6 s D 7 1821 w m 6 t D H 5 1824 B m 7 s D 1 1836 w m 6 s 6 18A w f 6 t 48 1901 w f 6 s D 6 1903 w m 6 s D 3 1912 w m 6 t 14 1913 B f 6 t 6 1916 B f 6 t D 2 1917 w m 8 t D 13 1921 w m 6 s D H 4 1922 B f 6 t 3 1928 w m 6 s 12 1929 w m 6 t D H 1 1932 w f 6 s D 4 1933 w m 7 s D 8 1934 w f 6 s 5 19A w m 6 s 15 19B w f 7 s 7 19C w f 6 s 8 19D w m 6 s 16

Contractions: — B black; w white; m male; f female; 6 six-nippled; 7 seven-nippled; 8 eight-nippled; s single; t twin; d Dorset blood; h horned.

135

1909, Aug.19, ANCESTRY OF MULTI-NIPPLED RAMS. At BB Nursery.

1 17A w m 6 t 1907 2 1608 w m 6 s 1905 3 B f 3 t 4 1224 w m 6 s 1902 5 1326 w f 6 s 1903 6 7 8 907 w m 6 t 1899 9 940 B f 6 s 1899 10 907 s m 6 t 1899 11 720 B f 5 s 1897 12 13 14 15 1 1814 w m 6 s 1908 2 1337 w m 6 s 1903 3 1620 w f 4 s 1906 4 1221 w m 6 s 1902 5 526 B f 4 s 1805 6 1502 w m 5 t 1905 7 1101 w f 4 s 1901 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B

m 4 s 1894 11 256 B f 6 1892 12 w m 6 13 DorB w f 4 t 14 907 w m 6 t 1899 15 602 w f 4 t 1896 136 1 1821 w m 6 t 1908 2 1502 w m 5 t 1905 3 1011 w f 5 s 1900 4 w m 6 5 DorB w f 4 t 6 907 w m 6 t 1899 7 703 w f 4 s 1897 8 9 10 11 12 810 w m 6 t 1898 13 606 w f 4 s 1896 14 601 w m 4 t 1896 15 606 w f 4 s 1896 1 1824 B m 7 s 1898 2 1602 w m 5 t 1905 3 1326 w f 6 s 1903 4 w m 6 5 DorB w f 4 t 6 907 w m 6 t 1899 7 720 B f 5 s 1897 8 9 10 11 12 810 w m 6 t 1898 13 606 w f 4 s 1896 14 626 B m 5 t 1896 15 517 w f 4 s 1895 137 1909, Aug.20, 1 1836 w m 6 s 1908 2 17A w m 6 s 1907 3 1607 w f 6 t 1906 4 1608 w m 6 s 1905 5 B f 3 t 6 1337 w m 6 s 1903 7 1605 B f 6 s 1905 8 1224 w m 6 s 1902 9 1326 w f 6 s 1903 10 11 12 1221 w m 6 s 1902 13 526 B f 4 s 1895 14 1221 w m 6 s 1902 15 940 B f 6 s 1899 1 1903 w m 6 s 1909 2 1821 w m 6 t 1908 3 1424 w f 4 t 1904 4 1502 w m 5 t 1905 5 1011 w f 5 s 1900 6 907 w m 6 t 1899 7 1050 B f 4 t 1900 8 w m 6 9 DorB w f 4 t 10 907 w m 6 t 1899 11 703 w f 4 s 1897 12 810 w m 6 t 1898 13 606 w f 4 s 1896 14 15 529 B f 5 1895 138 1 1912 w m 6 t 1909 2 17A w m 6 t 1907 3 1605 B f 6 s 1905 4 1608 w m 6 s 1905 5 B f 3 t 6 1221 w m 6 s 1902 7 940 B f 6 s 1899 8 1224 w m 6 s 1902 9 1326 w f 6 s 1903 10 11 12 907 w m 6 t 1899 13 832 B f 6 s 1898 14 827 w m 6 t 1898 15 256 B f 6 1892 1 1917 w m 8 t 1909 2 1821 w m 6 t 1908 3 1606 w f 6 t 1906 4 1502 w m 5 t 1905 5 1011 w f 5 s 1900 6 1337 w m 6 s 1903 7 1505 B f 6 s 1905 8 w m 6 9 DorB w f 4 t 10 907 w m 6 t 1899 11 703 w f 4 s 1897 12 1221 w m 6 s 1902 13 526 B f 4 s 1895 14 1221 w m 6 s 1902 15 940 B f 6 s 1899 139 1 1921 w m 6 s 1909 2 1337 w m 6 s 1903 3 1817 B f 4 s 1908 4 1221 w m 6 s 1902 5 526 B f 4 s 1895 6 1502 w m 5 t 1905 7 1333 B f 6 s 1903 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B f 6 1892 12 w m 6 13 DorB w f 4 t 14 1224 w m 6 s 1902 15 832 B f 6 s 1898 1 1928 w m 6 s 1909 2 17A w m 6 t 1907 3 1529 w f 6 s 1905 4 1508 w m 6 s 1905 5 B f 3 t 6 1337 w m 6 s 1903 7 1045 B f 5 s 1900 8 1224 w m 6 s 1902 9 1326 w f 6 s 1903 10 11 12 1221 w m 6 s 1902 13 526 B f 4 s 1895 14 941 w m 6 t 1899 15 735 B f 6 1897 140 1 1929 w m 6 t 1909 2 1821 w m 6 t 1908 3 1706 B f 6 s 1907 4 1602 w m 5 t 1905 5 1011 w f 5 s 1900 6 1618 B m 6 t 1906 7 1019 B f 5 s 1900 8 w m 6 9 DorB w f 4 t 10 907 w m 6 t 1899 11 703 w f 4 s 1897 12 1221 w m 6 s 1902 13 1011 w f 5 s 1900 14 810 w m 6 t 1898 15 342 w f 4 s 1893 1 1933 w m 7 s 1909 2 1604 w m 6 t 1908 3 1608 w f 4 s 1908 4 1337 w m 6 s 1903 5 1260 w f 6 s 1902 6 1337 w m 6 s 1903 7 1702 w f 4 s 1907 8 1221 w m 6 s 1902 9 526 B f 4 s 1895 10 907 w m 6 t 1899 11 1047 w f 4 1900 12 1221 w m 6 s 1902 13 526 B f 4 s 1895 14 1502 w m 5 t 1905 15 1240 w f 5 t 1902 141 1 19A w m 6 s 1909 2 1337 w m 6 s 1903 3 w f 2 4 1221 w m 6 s 1902 5 526 B f 4 s 1895 6 7 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B f 6 1892 12 13 14 15 1 19D w m 6 s 1909 2 1337 w m 6 s 1903 3 w f 5 s 1 4 1221 w m 6 s 1902 5 526 B f 4 s 1896 6 7 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B f 6 1892 12 13 14 15 142

ANCESTRY OF MULTI-NIPPLED EWES. At BB Nursery.

1 1505 B f 6 s 1905 2 1221 w m 6 s 1902 3 940 B f 6 s 1899 4 907 w m 6 t 1899 5 832 B f 6 s
1898 6 827 w m 6 t 1898 7 256 B f 6 1892 8 810 w m 6 t 1896 9 606 w f 4 s 1896 10 626 B m 5
t 1896 11 523 B f 4 t 1895 12 626 B m 5 t 1896 13 252 w f 4 s 1892 14 15 1 1606 w f 6 t 1906 2
1337 w m 6 s 1903 3 1606 B f 6 s 1905 4 1221 w m 6 s 1902 5 526 B f 4 s 1895 6 1221 w m 6 s
1902 7 940 B f 6 s 1899 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B f
6 1892 12 907 w m 6 t 1899 13 832 B f 6 s 1898 14 832 m f 6 t 1898 143 1 1706 B f 6 s 1907 2
1618 B m 6 t 1906 3 1019 B f 5 s 1900 4 1221 w m 6 s 1902 5 1011 w f 5 s 1900 6 810 w m 6 t
1898 7 342 w f 4 s 1893 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 907 w m 6 t 1899 11 703 w f 4
s 1897 12 626 B m 5 t 1896 13 234 w f 4 s 1892 14 73 w m 4 1890 15 16-88 w f 4 1888 1 1734
w f 7 s 1907 2 1337 w m 6 s 1903 3 1326 w f 6 s 1903 4 1221 w m 6 s 1902 5 526 B f 4 s 1895 6
907 w m 6 t 1899 7 720 B f 5 s 1897 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894
11 256 B f 6 1892 12 810 w m 6 t 1898 13 606 w f 4 s 1896 14 626 B m 5 t 1896 15 517 w f 4 s
1895 144 1 17B w f 6 t 1907 2 3 t

(Nothing further known of ancestry).

1 1805 w f 6 t 1908 2 1337 w m 6 s 1903 3 1250 w f 6 s 1902 4 1221 w m 6 s 1902 5 526 B f 4 s
1895 6 907 w m 6 t 1899 7 1047 w f 4 1900 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m
4 s 1894 11 256 B f 6 1892 12 810 w m 6 t 1898 13 606 w f 4 s 1896 14 15 1 18A w f 6 t 1908
2 1337 w m 6 s 1903 3 w f 2 4 1221 w m 6 s 1902 5 526 B f 6 s 1895 6 7 8 907 w m 6 t 1899 9
832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B m 6 1892 12 13 14 15 145 1 1901 w f 6 s 190? 2
1337 w m 6 s 1903 3 1620 w f 4 s 1908 4 1221 w m 6 s 1902 5 526 B f 4 s 1895 6 1502 w m 5 t
1905 7 1101 w f 4 s 1901 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B
f 6 1892 12 w m 6 13 DorB w f 4 t 14 907 w m 6 t 1899 15 602 w f 4 t 1896 1 1913 B f 6 t 1909 2
17A w m 6 t 1907 3 1505 B f 6 s 1905 4 1608 w m 6 s 1905 5 B f 3 t 6 1221 w m 6 s 1902 7 940
B f 6 s 1899 8 1224 w m 6 s 1902 9 1326 w f 6 s 1903 10 11 12 907 w m 6 t 1899 13 832 B f 6
s 1898 14 827 w m 6 t 1898 15 256 B f 6 1892 146 1 1916 B f 6 t 1909 2 1821 w m 6 t 1908 3
1606 w f 6 t 1906 4 1502 w m 5 t 1906 5 1011 w f 5 s 1900 6 1337 w m 6 s 1903 7 1505 B f 6 s
1905 8 w m 6 9 DorB w f 4 t 10 907 w m 6 t 1899 11 703 w f 4 s 1897 12 1221 w m 6 s 1902 13
526 B f 4 s 1895 14 1221 w m 6 s 1902 15 940 B f 6 s 1899 1 1922 B f 6 t 1909 2 17A w m 6 t
1907 3 1725 B f 6 t 1907 4 1508 w m 6 s 1905 5 B f 3 t 6 1618 B m 6 t 1906 7 940 B f 6 s 1899
8 1224 w m 6 s 1902 9 1326 w f 6 s 1903 10 11 12 1221 w m 6 s 1902 13 1011 w f 5 s 1900 14
827 w m 6 t 1898 15 256 B f 6 1892 147 1 1932 w f 6 s 1909 2 17A w m 6 t 1907 3 1813 w f 6
s 1908 4 1608 w m 6 m 1905 5 B f 3 t 6 1337 w m 6 s 1903 7 1709 B f 4 s 1907 8 1224 w m 6
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1905 15 1208 w f 5 s 1902 1 1934 w f 6 s 1909 2 1337 w m 6 s 1903 3 1827 B f 4 s 1908 4 1221
w m 6 s 1902 5 526 B f 4 s 1895 6 17A w m 6 t 1907 7 1606 w f 6 t 1906 8 907 w m 6 t 1899
9 832 B f 6 s 1898 10 417 B m 4 s 1894 11 256 B f 6 1892 12 1508 w m 6 s 1905 13 B f 3 t 14
1337 w m 6 s 1903 15 1505 B f 6 s 1905 148 1 19B w f 7 s 1909 2 1337 w m 6 s 1903 3 w f E 4
1221 w m s s 1902 5 ?26 B f 4 s 1895 6 7 8 907 w m 6 t 1899 9 ?32 B f 6 s 1898 10 417 B m 4

s 1894 11 256 B f 6 1892 12 13 14 15 1 19c w f 6 s 1909 2 1337 w m 6 s 1903 3 w f 3 s 4 1221
w m 6 s 1902 5 526 B f 4 s 1895 6 7 8 907 w m 6 t 1899 9 832 B f 6 s 1898 10 417 B m 4 s 1894
11 ??6 B f 6 1892 12 13 14 15 149

1909, Aug.21, CONCERNING SHEEP TABLES.

In the tables relating to the ancestry of the multi-nippled sheep of Beinn Bhreagh (pp.135-14?), seven columns of dentils are given:—

1st Column:— Ancestral numbers.

2nd Column:— Names of the sheep.

3rd Column:— Color (b black, w white).

4th Column:— Sex (m male, f female).

5th Column:— No. of nipples (2,3,4,5,6,7 or 8).

6th Column:— Single or twin (s single, t twin).

7th Column:— Year of birth.

1st Column.

Ancestral Numbers:— the ancestors of the sheep are numbered consecutively as shown; even numbers being assigned to the males, and odd numbers to the females. In the tables they progress from 2 to 15; but it is obvious that the numbering could be continued indefinitely to include higher generations.

1 represents the sheep itself whose ancestry we are considering.

2 and 3, are the "First-parents" (father and mother).

4,5,6 and 7, are the "Second-parents" (grandparents).

8,9,10,11,12,13,14 and 15, are the "Third-parents" (great-grandparents).

The "Fourth-parents" would be numbered from 16 to 31; the "Fifth-parents" from 32 to 63; the "Sixth-parents" from 64 to 127 etc.

150

The ancestral numbers seem to possess many curious properties, which may perhaps facilitate the investigation of questions concerning heredity. I shall only allude to a few points here.

The ancestral number 2, represents the father of the sheep whose ancestry we are considering; but it does more than this, for it seems to represent the abstract relationship indicated by the word "father". If, for example, you multiply the ancestral number of any sheep by 2, you get its father's ancestral number.

The father of 2 is 4.

The father of 3 is 6.

The father of 4 is 8. etc.

2 is the father; and 3 the mother. Multiply by 2 and you get the father of any sheep; but multiply by 3 and you don't get the mother.

To make the ancestral numbers, in all cases, indicate abstract relationship, consider them as powers of 2, plus whatever figure is required to complete the number.

2. The father = $2 + 0$

3. The mother = $2 + 1$

4. The father's father = $4 + 0$

5. The father's mother = $? + 1$

6. The mother's father = $4 + 2$

7. The mother's mother = $4 + 3$

8. The father's father's father = $8 + 0$

15. The Mother's mother's mother = $8 + 7$ etc.

“Mother” = $2 + 1$

The mother of 2 = $2 \times 2 + 1 = 5$

The mother of 3 = $3 \times 2 + 1 = 7$

The mother of 9 = $9 \times 2 + 1 = 19$

“Maternal Grandfather” = $4 + 2$

Maternal grandfather of 2 = $2 \times 4 + 2 = 10$

Maternal grandfather of 3 = $3 \times 4 + 2 = 14$

Maternal grandfather of 9 = $9 \times 4 + 2 = 38$.

“Paternal Grandmother” = $4 + 1$

Paternal grandmother of 2 = $2 \times 4 + 1 = 9$

Paternal grandmother of 7 = $7 \times 4 + 1 = 29$

Paternal grandmother of 15 = $15 \times 4 + 1 = 61$

Enough has been shown to indicate that these ancestral numbers possess curious properties. By their use we can indicate complicated relationships between sheep, in an exact manner, and in a way that cannot be expressed by words.

2nd Column.

Names of the Sheep. The first sheep born on Beinn Bhreagh during my occupancy of the place appeared in 1890 and were numbered 1,2,3,4, etc. (there were less than 100 of them) The sheep born in 1901 were numbered 101,102,103, etc. Those born in 1892 were numbered 201,202,203, etc. Those born in 1893 were numbered 301,302,303, etc. As our policy is to have only a small flock we

have less than 100 lambs born each year. The above plan of numbering enables us to ascertain at once, from its number, the year of birth of any sheep.

For the purpose of systematically introducing into the flock each year, a little new blood to prevent too close inbreeding, we purchase lambs having the characteristics of our flock from neighboring farmers, helping them to produce such lambs by leaning them our multi-nippled rams. The purchased sheep are named by the letters of the alphabet, A, B, C, etc., with a figure prefixed indicating the year of birth. Examples:—

17A is a purchased sheep born in 1907.

18A is a purchased sheep born in 1908.

19A is a purchased sheep born in 1909.

The other Columns.

Third Column, color:— The entries in the columns may, as a rule, be taken as the answers to direct questions which can be answered by yes or no. But every such question is capable of a third reply "I don't know". Take for example the black part of the color column.

The question Was this sheep black?

Answers. Yes B (black).

No. — (not black).

Don't know ... (unknown).

The following specimens will show the application of this method of symbolization:— 153

B — Black (not white)

— w White (not black)

... Unknown whether white or black.

m — Male (not female)

— f Female (not male)

... Unknown whether male or female.

2 2 nipples (not 3,4,5,6,7 or 8)

3 3 nipples (not 2,4,5,6,7 or 8)

4 4 nipples (not 2,3,5,6,7 or 8)

5 5 nipples (not 2,3,4,6,7 or 8)

6 6 nipples (not 2,3,4,5,7 or 8)

7 7 nipples (not 2,3,4,5,6 or 8)

8 8 nipples (not 2,3,4,5,6 or 7)

Number of nipples unknown.

s - single (not twin)

- t twin (not single)

... Unknown whether single or twin.

The seventh column gives the year of birth. AGB.

154

1909, Aug.23, LABORATORY.

The Oionos Aerodrome.

Aug. 16: — We received into stock to-day all the three different sized wires for the new Oionos aerodrome; also the sail-silk for the surfaces. WFB.

The Cygnet II.

Aug.17: — The weight of Cygnet II, ready to be flown as a kite, is 430 lbs. or 195.220 kg. I beg to forward a photograph showing her present condition (see p. 155). WFB.

Model of Cygnet II.

Aug.17: — I enclose details of ten sets of observations upon the flight of the Cygnet model made to-day.

WFB.

Model of Oionos Aerodrome.

Aug.20: — We are assembling the framework of the Oionos model. Expect to have it in shape to photograph to-day.

WFB.

Aug.21: — On assembling the Oionos model we found that the tin we used for sockets was so thin that it bent up between the point where the strut terminated and the point of attachment to the surfaces. We are therefore re-inforcing

155

LIBRARY OF ALEXANDER GRAHAM BELL

The Cygnet II arranged to be flown as a kite. Photo by J. McNeil.

156

Model of Oionos Aerodrome. Specimen of the ribs. Photo by J. McNeil.

Model of Oionos Aerodrome. Struts and corner-pieces. Photo by J. McNeil.

157

Model of Oionos Aerodrome. Framework for the main surface. Photo by J. McNeil.

Model of Oionos Aerodrome. At work on the frameworks of the two smaller surfaces. Photo by J. McNeil.

158

Model of the Oionos Aerodrome. The framework assembled. Photo by J. McNeil.

Model of the Oionos Aerodrome. The framework assembled. Photo by J. McNeil.

159

the socket on this portion, and think that we will overcome the difficulty in this way. I forward photographs illustrating the progress of the work on this model (see pp 156,157,158).

WMB.

THE CANADIAN AERODROME COMPANY.

The Baddeck No. II.

Aug.17: — Glad to any that Baddeck No.II is coming along very nicely, and would dare say it will be ready for flying by the middle of next week unless we are held up for stock which we expect very soon. MI.

Petewawa Photographs of Baddeck I.

Aug.21: — I enclose some postal card photographs of the Baddeck No.I which were taken at Petewawa.(See photos. pp 160, 161 and 162).

McC.

160

138209-A Alb 1

Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

138581-A Alb 2

Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

161

138207-A Alb 1

THE PETAWAWA AIR SHIP BADDECK NO. I. Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

138208-A Alb 1

BADDECK NO I GETTING INTO SHAPE Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

162

138210-A Alb 1

GENERAL OTTER WAITING TO SEE TRIAL OF AIR-SHIP Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

138211-A Alb 1

PETAWAWA AIR SHIP READY FOR FLIGHT Baddeck No.I at Petewawa. Photo copied by J. McNeil from a postal card photo issued in Pembroke.

163

DEPARTMENT.

Damage to Beinn Bhreagh Roads.

Aug.19: — Last night's rain storm has done great damage to the Beinn Bhreagh roads. It came down in such torrents that in some cases the bridges and al?ices were not large enough to allow all the water to pass through; while in other cases the stones and gravel carried along by the force of the water completely blocked them, consequently the water rushed over the roads digging in them deep trenches.

The most damage was done on the North Shore Road. Besides being badly trenched, the water from Melville Glen completely destroyed the bridge near John McDermid's stable and carriage-barn, leaving a dangerous gap in the road which is quite impassable for horses and carriages. Traffic at this point is only possible by driving through the water around the point of obstruction. Repairs will be pushed at once.

The Golden Wedding Road is also in a very bad condition. At present it is impassable further than the railing. There the water has carried away, I should judge, about 30 cart-loads of gravel. Men are now at work re-opening the road at this point.

Bras d'Or Avenue, Hubbard Road, and the High Level Road, although considerably damaged, withstood the storm better than could be expected.

164

The public road outside Beinn Bhreagh entrance is in a very bad condition, the rain treating it in a similar manner to the BB roads, and also carried away the bridge in the hollow below John McDonald's house. PM.

News of the Zulu Sheep.

Aug.21: — Dr. Bell has received advices from England explaining why the black-and-white four-horned Zulu sheep for the Farm Department were not sent by the steamer Tobacco as arranged.

The steamer's arrival in Liverpool had been so delayed by ice on the Newfoundland coast that it was thought better to send the sheep by the steamer Mongolian.

The Mongolian left Liverpool Aug.14, and is expected to reach Halifax next Wednesday, (Aug.25). I will go on to Halifax in time to meet the steamer on its arrival there, and bring the sheep to Beinn Beinn Bhreagh. PM.

165

DEPARTMENT OF BUILDINGS AND WHARVES.

Damage to Crescent Grove Boat-house.

Aug.20: — A visit to Crescent Grove Boat-house this morning showed conditions resulting from yesterday's freshet which render it inadvisable to remodel said boat-house, as proposed, into a summer cottage for Mr. and Mrs. Frost and Miss Georgina McCardy, as a similar storm might undermine a heavier structure with serious results.

The proposition now is to build a small Bungalow on the brow of the small hill just west of the boat-house. Plans for above Bungalow are now being prepared. CCB.

The Glass-bottomed House-boat.

Aug.20: — The new glass-bottomed float for the "Ugly Duckling" house-boat is nearly completed. CCB

LIST OF EXPERIMENTS. (Aug.15-21).

Aug.19: — Half-sized model of Cygnet II flown on the bay. 10 sets of observations. Bedwin reports that the kite was brought back on the tilting-arms of the "Get-Away" without a mishap.

AGB.

166

BEINN BHREAGH ITEMS Aug.15-?1.

Visitors at BB Nursery Aug.16.

Aug.16: — Visitors registered at BB Nursery to-day:— James Pryer Chester of Penn., Albert M. McLeod of Sydney, George Hollifield of Baddeck, and Angus McInnis of Big Baddeck.

JGD.

Aug.16: — Angus McInnis, A.M. McLeod, M.H. Morrison, and J.C. Davidson leave to-morrow morning (Aug.17) for Margaree. This is the eighth annual fishing excursion the above party has had together. Mr. E?an MacAskill of Baddeck will join the party at Margaree Forks on Wednesday (Aug.16).

JGD.

Aug.16: — Fences on the farms are not good enough for BB sheep. The sheep received by William Crowdis from BB Nursery found their way over fences to the neighboring farm of A.Y. McDonald, and seem quite contented now that they have got among some of their own kin. Multi-?ipped sheep must be a distinct breed, and don't care to associate with the ordinary sheep of the farm.

JGD.

Aug.16: —Edward Dart leaves Beinn Bhreagh to-morrow morning (Aug.17) to join his sister, who emigrated with him a few months ago, on a farm at A?herst Point, M.S.

JGD.

167

Malcolm McFarlane goes to Sydney.

Aug.16: — Word received from Mr. Malcolm McFarlane on Saturday (Aug.14) that he was not any better. His eyes are in such a condition that he has gone to Sydney to-day to consult a specialist.

WFB.

Aug.16: — Miss Mabel B. McCurdy has thrown away her crutches, and has gone off for a weeks vacation. AGB.

Visitors at Laboratory Aug.16.

Aug.16: — Visitors registered at the Laboratory to-day were, Messrs. A.J. McDonald, Alexander Taylor, and D.J. Macrae of Baddeck; and Mrs. W.H. Wright, and Miss Harriet Wright of Saginaw, Michigan.

WFB.

Aug.17: — Master Alexander Graham Bell Fairchild is three years old to-day. He was born in Dr. Bell's Study in Washington, D.C. Aug.17, 1906. AGB.

Aug.17: — Mrs. Ingraham is visiting Beinn Bhreagh to-day where she and Mrs. Byrnes are enjoying an afternoon berry picking.

KI

Aug.17: — We are glad to report that Mr. Badderhem is back to work at the Aerodrome Factory once more, after enjoying two weeks at North Sydney.

KI.

A Ghost seen on Beinn Bhreagh.

Aug.16: — Some of the good people here have been much excited over the reported appearance of a ghost on Beinn Bhreagh Aug.13. In order to get at the exact facts of the case I requested a gentleman to interview the eye witnesses, and get an authentic account for the Recorder. The following is his report:—

Something of a very mysterious nature was seen by two young men on the evening of the 13th inst., while sailing in a motor boat along the shore opposite the graveyard on Beinn Bhreagh.

This mysterious something appeared in the form of the fair sex; and the two young gentlemen, who had evidently been expecting two of the fair sex from the conversation which passed between them, were obliged to conclude, much to their sorrow, that only one was coming.

At this stage of the drama they were about 200 hundred yards distant, and they decided on having a closer observation of her. For this purpose the boat was headed in-shore, whereupon, to their great disappointment, she started to run at the speed of a race horse; and not content with that, she took wings, and disappeared out of their sight like a flash.

The “Silver-Dart” flew very fast, but she could not begin to compete with this odd thing whatever it may have been. However they are unable to say how it alighted. Perhaps it was of like nature to the last drop of the “Dart”; and for their part they hope it was, never wishing to see it again”.

The above report has been submitted to one of the eye witnesses, and he declares it is a satisfactory account.

AGB.

An Ant Story.

Aug.18: — A little engineering work done by ants the other day would, if in any way interesting to you, make quite a little story for the Recorder.

An ant was observed trying to haul a green grub three times its own size, and therefore probably twenty-seven times its weight, and was having a good deal of trouble in doing so. Another ant was walking around at its leisure apparently not at all concerned in the work going on. When however the first ant got stalled, and was unable to move the grub, the second ant came to his assistance.

He got behind the grub and pushed, while his companion-pulled. The two together succeeded in carrying it off, although one alone could hardly move it. This looks like intelligent co-operation.

KI.

Return of Baldwin and McCurdy.

Aug.19: — Mr. and Mrs. F.W. Baldwin, and Mr. J.A. Douglas McCurdy arrived at Beinn Bhreagh to-day from Petewawa.

AGB.

Aug.19: — Mr. and Mrs. Walter Frost called at BB Hall. Mr. Frost is about to leave for Boston. Mrs. Frost and her baby will remain on Baddeck Bay for the present with Miss Georgina McCurdy.

AGB.

170

Rain Storm of Aug.18-19.

Aug.19: — We had the biggest rain storm of the season last night and this morning. Great damage has been done on Beinn Bhreagh.

AGB.

Aug.19: — Queit game between the Laboratory and the Aerodrome Company was called off yesterday on account of the weather. There are motor boat races to-day and to-morrow, so the game is postponed until some day next week.

WFB.

Alexander Fairchild's Birthday Party.

Aug.20: — A child's party was held to-day at BB Hall in honor of the birthday of Alexander Fairchild (who was born Aug.17, 1906). Among the children present were Melville Gertrude, Mabel, Lilian, and Alec Grosvenor; Alexander and Barbara Fairchild; Ruth and Edith Davidso ; Louise and Freeman Bedwin; Tommy Byrnes; Alice McCurdy; Agnes McGill; McGill ; Edna ; and Edith and Joshua Pike. A ride in the hay-cart was specially enjoyed by the children judging by the noise they made.

AGB.

Aug.20: —Only two boats the Gauldrie and Swerm, entered the handicap motor boat race at Baddeck last evening The Gauldrie won, making one win for each of the following boats:- Hope, Randolph, Gauldrio, Qui Vive, Sworm, WFB.

171

Aug.20: — Mrs. Wynne Bedwin, with two little daughters, visiting Mrs. Rudderham at the farm house, arrived at Beinn Bhreagh Aug.13. Mrs. Bedwin is a sister of Mr. Rudderham who is working at the Aerodrome Factory. CCB.

Visitors at BB Laboratory Aug.20.

Aug.20: — Visitors registered at the Laboratory to-day were Mr. and Mrs. John MacVicker, and Mrs. Andrew Walker of New Glasgow, N.S. WFB.

A Testing Ground for Aerodromes.

Aug.20: — Mr. F.W. Baldwin and Mr. Douglas McCurdy went to Baddeck to-day, and carefully examined the shore land beyond Kidston's Island which had been proposed as an aerodrome park for Baddeck. They report that the ground is not suitable for the purpose.

AGB.

Aug.21:— Messrs. Baldwin and McCurdy, accompanied by Mrs. Bell, Mrs. Baldwin, Mrs. Frost and Melville Grosvenor drove to Big Baddeck to-day in search of a testing ground for aerodromes,

AGB.

172

THE CONTRIBUTIONS OF XYZ.

Explanation of the Ghost.

Aug.21: — The appearance of a veritable ghost on Beinn Bhreagh is rather an unusual occurrence worthy of being chronicled in the Recorder; especially a ghost provided with wings, and able to fly like the "Silver-Dart".

The female figure, robed in white, and dimly seen in the growing dusk advanced from the direction of the graveyard upon the startled observers, then ran towards the Central Wharf with the speed of a race horse, and finally took to the air, disappearing over the top of the Warehouse, and headed straight for the Aerodrome Company's Factory upon the hill. Surely there must be some significance to this.

Just think also of the date. If it had been the first of April we might have laughed at the whole matter as a joke, but it was not. It was the 13th of the month, an unlucky number; and a Friday too, an unlucky day. Surely this is significant of misfortune and disaster.

Many people here have been puzzling their brains for a satisfactory explanation of the msyterious occurrence and it has come at last:— Mr. Douglas McCurdy's return to Beinn Bhreagh has solved the mystery.

Mr. McCurdy has reason to remember the date of the accident to the aerodrome "Baddeck No. I", at Petewawa, 173 for he was in the machine at the time. He now finds, by making a sufficient allowance for a difference of local time, that the apparition appeared on the very day, at the very hour, at the very minute, and at the very moment when the Baddeck No. I landed on her tail at Petewawa.

Here then is the explanation:— The apparition was the spirit of Baddeck No. I on its way to the aerodrome factory to announce its own destruction. XYZ.

The Spirit of Flight.

Aug.21: — In further corroboration of the above idea, I beg to forward you the title page of the “American Aeronaut” for Aug. 1909, showing the colored frostiepiece by Berdanier entitled “The Spirit of Flight”, in which “Baddeck No.I, or at least one of the aerodromes of the Hammondsport type has been taken as the example.

Perhaps, after examining the picture, the witnesses can tell whether the spirit portrayed, resembled the Beinn Bhreagh Ghost. If so, this would be proof positive of the truth of the explanation offered (see p.174). XYZ.

174

“The Spirit of Flight” by Berdanier. The colored frontispiece forming the title page of the “American Aeronaut” for August, 1909.

175

1909, Aug.28 SOME FACTS CONCERNING THE CANADIAN AERODROME COMPANY AND ITS WORK: by J.A. Douglas McCurdy

Aug.27:— The Aerial Experiment Association which expired by time limitation on March 31, 1909, had performed a certain work. It was fully realized that, although the different steps had gone under the head of “experimental work”, still the machines embodied the essential features which go to make up not only a practical but a commercial aerodrome.

It was never the intention of the Association, however, to enter into this field of commerce. That was left to be the work of some Company organized specially for this purpose. Mr. Bell suggested that two of the members of the A.H.A. — F.W. Baldwin J.A.D. McCurdy — should work together as a company and quietly build and produce a machine such as they would like to sell to the Canadian or British Government. Mr. Bell further proposed that he should loan the Company sufficient money to construct two machines; this money to be paid back upon the completion of the first sale. The name finally adopted was “The Canadian Aerodrome Company” and their headquarters were established at Beinn Bhreagh in the building formally known as the “kite house” on the flying field at the Laboratory.

The first thing to be done was to decide upon the general design, dimensions, lines, etc. to be followed in the construction of the machines. The general design of the Silver-Dart was decided upon and its form adopted as a standard 176 model. One of the greatest departures, however, was in using trussed ribs which allowed of three distinct advantages. 1. That of greater strength afforded by the depth of rib; 2. Two layers of cloth which would completely imbed the rib; and 3. Afford a

space where the horizontal diagonal wires could be placed where they could be completely hidden and so reduce the head resistance.

Instead of using for our surfaces specially prepared rubber silk we selected No.10 grade of the cloth used for light sails in racing crafts. This material is very light and strong and almost impervious to air besides having the distinct advantage of not being easily rotted.

The wing tips were curved at the back edge instead of being triangular as in the Silver-Dart. This form gave them almost double the area.

Early in May I made a trip through the motor factories of Canada and the United States where a motor such as would suit our purpose would be likely found and our choice finally fell on a Kirkham motor manufactured at Bath, New York. A thorough test was made of the motors he had in stock and the horse-power at varying speeds determined. This test pointed out the fact that 40 H.P. could be relied upon at 1400 rpm. while the motor was capable of developing 48 H.P. at slightly over 2000 rpm. Mr. Kirkham assured me that he could construct for us a motor the same as the one tested but having a chrome steel crank shaft and aluminum casings which would weigh 320 lbs. (including a Bosch high tension magneto) and for which he would charge \$800.00.

177

After consulting with Baldwin by telegraph the order was speedily placed and delivery guaranteed within three weeks. A few days before the date set for delivery Baldwin arrived at Bath and ran a test on the new motor which fully satisfied our expectations and orders were at once given to have the motor shipped to Petewawa, Ontario, where, at the invitation of the Canadian Government, was proposed to try out our new machine together with the Silver-Dart.

A unique gasoline tank was constructed of copper to fit exactly between the cloths of the top surface of the center panel with its top and bottom conforming absolutely to the curve of the surface. With such construction the head resistance was cut down to zero.

The form of radiator used was also original with us and, I think, will hold a very important place in aerodrome construction in the future. It consists of sixteen cubes made up in two distinct sections; one section of eight tubes being placed between the front struts of the first panel on the port side. Each tube is three inches wide, 3/32nds thick and 6 feet 6 inches long and carries the same curve given to the supporting surfaces. This gives us a cooling surface of 52 sq. ft. Whether this is sufficient or not to cool the 40 H.P. engine has not yet been determined.

Another departure from the Silver-Dart design is in the front control the surfaces of which are given a slight curve similar to that of the main surfaces instead of being 178 flat as in former cases. This curve is not in the lateral but in the fore-and-aft direction.

Tubing was used throughout the machine where necessary, bamboo being entirely done away with. The hubs of the wheels and the running gear were made from our design and have twice the length of the ordinary hub in a wheel. This gives the spokes a greater angle of spread which will give the wheel greater resisting power to skidding straine.

So far our staff has comprised about eight to ten men with Mr. Kenneth Ingraham as foreman and as each man is becoming every day more skilled in his special line, it is safe to predict that machines of the future can be turned out in a much shorter period of time and with perhaps better workmanship than those our first aerodromes. McC.

179

STUDY OF ANCESTRY OF MULTI-NIPPLED SHEEP by A.G. Bell

Black White Unknown Rams Sh P1 P2 P3 Sh P1 P2 P3 Sh P1 P2 P3 17A wm 6n tw 1 2 1 1 2 2
2 4 1814 wm 6n s 1 3 1 2 3 5 1821 wm 6n tw 1 2 4 4 4 1824 wm 7n s 1 1 1 2 3 3 4 1836 wm 6n
s 2 2 1 2 2 4 2 1903 wm 6n s 1 1 1 2 3 6 1 1912 wm 6n tw 1 2 2 1 1 2 4 2 1917 wm 6n tw 1 2 1 2
3 6 1921 wm 6n s 1 2 4 1 1 2 4 1928 wm 6n s 2 2 1 2 2 4 2 1929 wm 6n tw 1 2 1 1 2 8 1933 wm
7n s 2 1 2 4 6 19A wm 6n s 1 3 1 2 1 1 2 4 19D wm 6n s 1 3 1 2 1 1 2 4 Single Twin Unknown
Rams Sh P1 P2 P3 Sh P1 P2 P3 Sh P1 P2 P3 17A wm 6n tw 1 2 2 1 1 2 2 4 1814 wm 6n s 1 2 3
2 1 4 2 1921 wm 6n tw 1 1 2 1 1 2 2 1 4 1826 Bm 7n s 1 1 1 2 1 2 2 1 4 1836 wm 6n s 1 1 3 6 1
1 2 1903 wm 6n s 1 1 2 2 3 3 3 1912 wm 6n tw 1 3 3 1 1 1 2 3 1917 wm 6n tw 3 5 1 2 1 2 1 1921
wm 6n s 1 2 3 4 1 2 2 19?? wm 6n s 1 1 3 4 1 1 1 3 1929 wm 6n tw 1 2 4 1 1 2 3 1 1933 wm 7n
s 1 1 4 4 1 3 1 19A wm 6n s 1 1 2 2 1 1 2 ? 19D wm 6n s 1 2 2 2 1 2 5 180 1909, Aug.27, 2n 3n
4n Rams Sh P1 P2 P3 Sh P1 P2 P3 Sh P1 P2 P3 17A wm 6n tw 1 1814 wm 6n s 1 2 3 1821 wm
6n tw 2 3 1824 Bm 7n s 1 2 1836 wm 6n s 1 1 1903 wm 6n s 1 1 3 1912 wm 6n tw 1 1917 wm 6n
tw 3 1921 wm 6n s 1 1 2 1928 wm 6n s 1 1 1929 wm 6n tw 3 1933 wm 7n s 1 1 3 19A wm 6n s
1 1 1 19D wm 6n s 1 1 5n 6n 7n 17A wm 6n tw 1 1 1 2 3 1814 wm 6n s 1 1 1 1 5 18?1 wm 6n tw
2 1 2 1 1824 Bm 7n s 1 1 1 1 2 1 1 1836 wm 6n s 1 2 3 5 1903 wm 6n s 2 1 1 1 1 3 1912 wm 6n
tw 1 2 3 6 1917 wm 6n tw 2 2 2 5 1921 wm 6n s 1 1 1 2 6 1928 wm 6n s 1 1 2 2 5 1929 wm 6n
tw 3 1 1 2 1 4 1933 wm 7n s 2 1 3 3 1 19A wm 6n s 1 1 1 3 19D wm 6n s 1 1 1 1 3 8n Unknown.
17A wm 6n tw 2 4 1814 wm 6n s 1821 wm 6n tw 4 1824 Bm 7n s 4 1836 wm 6n s 2 1903 wm 6n
s 1 1912 wm 6n tw 2 1917 wm 8n tw 1 1921 wm 6n s 1938 wm 6n s 2 1929 wm 6n tw 1933 wm
7n s 19A wm 6n s 2 4 19D wm 6n s 2 4 18? Black White Unknown Ewes Sh P1 P2 P3 Sh P1 P2

P3 Sh P1 P2 P3 1605 Bf 6n s 1 1 2 3 1 2 3 2 1606 wf 6n tw 1 2 5 1 1 2 3 1706 Bf 6n s 1 2 2 4 6
1734 wf 7n s 2 4 1 2 2 4 17B wf 6n tw 1 2 4 6 1806 wf 6n tw 1 3 1 2 3 3 2 18A wf 6n tw 1 3 1 2 1
1 2 4 1901 wf 6n s 1 3 123 5 1915 Bf 6n tw 1 1 2 2 1 2 4 2 1916 Bf 6n tw 1 1 2 2 2 6 1922 Bf 6n
tw 1 1 3 1 1 1 3 2 1932 wf 6n s 2 1 1 2 2 5 2 1934 wf 6n s 1 1 5 1 1 3 3 19B wf 7n s 1 3 1 2 1 1 2
4 19C wf 6n s 1 3 1 2 1 1 2 4 Single Twin Unknown Ewes Sh P1 P2 P3 Sh P1 P2 P3 Sh P1 P2
P3 1605 Bf 6n s 1 2 1 2 2 4 1 2 1606 wf 6n tw 2 4 3 1 3 2 1706 Bf 6n s 1 1 8 3 1 1 3 2 1734 wf
7n s 1 2 3 4 1 3 1 17B wf 6n tw 1 1 1 4 6 1805 wf 6n tw 2 2 3 1 1 2 1 3 18A wf 6n tw 1 2 2 1 1 1 2
6 1901 wf 6n s 1 2 3 2 1 4 2 1913 Bf 6n tw 1 3 3 1 1 1 2 3 1916 Bf 6n tw 3 5 1 2 1 2 1 1922 Bf 6n
tw 2 4 1 2 2 1 3 1932 wf 6n s 1 1 3 5 1 1 1 2 1934 wf 6n s 1 2 2 5 2 2 1 19B wf 7n s 1 1 2 2 1 1 2
5 19C wf 6n s 1 2 2 2 1 2 3 182 2n 3n 4n Ewes Sh P1 P2 P3 Sh P1 P2 P3 Sh P1 P2 P3 1505 Bf
6n s 3 1606 wf 6n tw 1 1 1706 Bf 6n s 1 4 1734 wf 7n s 1 3 17B wf 6n tw 1805 wf 6n tw 2 2 18A
wf 6n tw 1 1 1 1901 wf 6n s 1 2 3 1913 Bf 6n tw 1 1916 Bf 6n tw 3 1922 Bf 6n tw 1 1932 wf 6n s
1 1 1 1934 wf 6n s 1 1 1 1 19B wf 7n s 1 1 1 19C wf 6n s 1 1 1 Ewes 5n 6n 7n 1505 Bf 6n s 2 1
2 4 1 1606 wf 6n tw 1 2 3 7 1706 Bf 6n s 1 1 1 1 1 2 3 1734 wf 7n s 1 1 2 2 4 1 17B wf 6n tw 1
1805 wf 6n tw 1 2 2 4 18A wf 6n tw 1 1 1 3 1901 wf 6n s 1 1 1 1 5 1913 Bf 6n tw 1 2 3 6 1916 Bf
6n tw 2 1 2 2 5 1922 Bf 6n tw 1 1 2 3 5 1932 wf 6n s 2 1 2 2 3 1934 wf 6n s 1 1 3 6 19B wf 7n s 1
1 3 1 19C wf 6n s 1 1 1 3 Ewes ?n Unknown 1505 Bf 6n s 2 1606 wf 6n tw 1706 Bf 6n s 1734 wf
7n s 17B wf 6n tw 2 4 6 1805 wf 6n tw 2 18A wf 6n tw 2 4 1901 wf 6n s 1913 Bf 6n tw 2 1916 Bf
6n tw 1922 Bf 6n tw 2 1932 wf 6n s 2 1934 wf 6n s 19B wf 7n s 2 4 19C wf 6n s 2 4 183

1909 Aug 30 BLOOD VALUES OF THE MULTI-NIPPLED RAMS

17A 1814 1821 1824 1836 wm 6n tw wm 6n s wm 6n tw Bm 7n s wm 6n s Black Sh 25.000 P1
12.500 P2 6.250 6.250 12.500 P3 6.250 9.375 3.125 6.250 White Sh 25.000 25.000 25.000
25.000 P1 12.500 25.000 25.000 25.000 25.000 P2 12.500 18.750 25.000 18.750 12.500 P3
6.250 15.625 12.500 9.375 12.500 Unkn. Sh P1 P2 12.500 P3 12.500 12.500 12.500 6.250
Total 100.000 100.000 100.000 100.000 100.000 Single Sh 25.000 25.000 25.000 P1 12.500
25.000 12.500 12.500 12.500 P2 12.500 18.750 6.250 6.250 18.750 P3 6.250 6.250 6.250 6.250
18.750 Twin Sh 25.000 25.000 P1 12.500 12.500 12.500 12.500 P2 6.250 12.500 12.500 6.250
P3 6.250 12.500 6.250 6.250 Unkn. Sh P1 P2 12.500 6.250 6.250 P3 12.500 6.250 12.500
12.500 6.250 Total 100.000 100.000 100.000 100.000 100.000 184 1903 1912 1917 1921 1928
wm 6n s wm 6n tw wm 6n tw wm 6n s wm 6n s Black Sh P1 12.500 12.500 P2 6.250 12.500
6.250 12.500 12.500 P3 3.125 6.250 6.250 12.500 6.250 White Sh 25.000 25.000 25.000 25.000
25.000 P1 25.000 12.500 25.000 12.500 25.000 P2 18.750 12.500 18.750 12.500 12.500 P3
18.750 12.500 18.750 12.500 12.500 Unkn. Sh P1 P2 P3 3.125 6.250 6.250 Total 100.000
100.000 100.000 100.000 100.000 Single Sh 25.000 25.000 25.000 P1 12.500 25.000 12.500
P2 6.250 18.750 18.750 18.750 18.750 P3 6.250 9.375 16.625 12.500 12.500 Twin Sh 25.000
25.000 P1 25.000 12.500 25.000 12.500 P2 18.750 6.250 6.250 6.250 6.250 P3 9.375 6.250

6.250 6.250 3.125 Unkn. Sh P1 P2 P3 9.375 9.375 3.125 6.250 9.375 Total 100.000 100.000
 100.000 100.000 100.000 185 1929 1933 19A 19D wm 6n tw wm 7n s wm 6n s wm 6n s Black
 Sh P1 12.500 P2 12.500 6.250 6.250 P3 6.250 9.375 9.375 White Sh 25.000 25.000 25.000
 25.000 P1 12.500 25.000 25.000 25.000 P2 12.500 25.000 6.250 6.250 P3 25.000 18.750 3.125
 3.125 Unkn. Sh P1 P2 12.500 12.500 P3 12.500 12.500 Total 100.000 100.000 100.000 100.000
 Single Sh 25.000 25.000 25.000 P1 12.500 12.500 12.500 25.000 P2 12.500 25.000 12.500
 12.500 P3 12.500 12.500 6.250 6.250 Twin Sh 25.000 P1 12.500 12.500 P2 12.500 P3 9.375
 9.375 3.125 3.125 Unkn. Sh P1 12.500 P2 12.500 12.500 P3 3.125 3.125 15.625 15.625 Total
 100.000 100.000 100.000 100.000 186 17A 1814 1821 1824 1836 wm 6n tw wm 6n s wm 6n tw
 Bm 7n s wm 6n s 2n Sh P1 P2 P3 3n Sh P1 12.500 P2 6.250 P3 4n Sh P1 12.500 P2 12.500
 12.500 6.250 P3 9.375 9.375 6.250 3.125 5n Sh P1 25.000 12.500 P2 6.250 6.250 P3 3.125
 3.125 6n Sh 25.000 25.000 25.000 25.000 P1 12.500 12.500 12.500 25.000 P2 12.500 6.250
 12.500 12.500 18.750 P3 9.375 15.625 3.125 3.125 16.625 7n Sh 25.000 P1 P2 P3 8n Sh P1
 P2 P3 Unkn. Sh P1 P2 12.500 P3 12.500 12.500 12.500 6.250 Total 100.000 100.000 100.000
 100.000 100.000 187 1903 1912 1917 1921 1928 wm 6n s wm 6n tw wm 8n tw wm 6n s wm
 6n s 2n Sh P1 P2 P3 3n Sh P1 P2 6.250 6.250 P3 4n Sh P1 12.500 12.500 P2 6.250 6.250 P3
 9.375 9.375 6.250 3.125 5n Sh P1 P2 12.500 12.500 6.250 6.250 P3 3.125 6n Sh 25.000 25.000
 25.000 25.000 P1 12.500 25.000 25.000 12.500 25.000 P2 6.250 18.750 12.500 12.500
 P3 9.375 18.750 15.625 18.750 15.625 7n Sh P1 P2 P3 8n Sh 25.000 P1 P2 P3 Unkn. Sh P1 P2
 P3 3.125 6.250 6.250 Total 100.000 100.000 100.000 100.000 100.000 188 1929 1933 19A 19D
 am 6n tw um 7n s vm 6n s wn 6n s 2n Sh P1 12.500 P2 P3 3n Sh P1 P2 P3 4n Sh P1 12.500
 P2 6.250 6.250 6.250 P3 9.375 9.375 3.125 3.125 5n Sh P1 12.500 P2 18.750 P3 3.125 6.250
 6n Sh 25.000 25.000 25.000 P1 25.000 12.500 12.500 12.500 P2 6.250 18.750 6.250 6.250
 P3 12.500 9.375 9.375 9.375 7n Sh 25.000 P1 P2 P3 8n Sh P1 P2 P3 Unkn. Sh P1 P2 12.500
 12.500 P3 12.500 12.500 Total 100.000 100.000 100.000 100.000 189

BLOOD VALUES OF THE MULTI-NIPPLED EVES

1605 1606 1706 1734 179 Bf 6n s sf 6n tw Bf 6n s wf 7n s sf 6n tw Black Sh 25.000 25.000 P1
 12.500 12.500 25.000 P2 12.500 12.500 12.500 P3 9.375 15.625 6.250 12.500 White Sh 25.000
 25.000 25.000 P1 12.500 12.500 25.000 P2 12.500 12.500 25.000 12.500 P3 9.375 9.375
 18.750 12.500 Unkn. Sh P1 25.000 P2 25.000 P3 6.250 25.000 Total 100.000 100.000 100.000
 100.000 100.000 Single Sh 25.000 25.000 26.000 P1 25.000 25.000 12.500 27.000 P2 6.250
 25.000 16.750 16.750 P3 6.250 9.375 9.375 12.500 Twin Sh 25.000 25.000 P1 12.500 12.500
 P2 12.500 6.250 6.250 P3 12.500 9.375 9.375 9.375 Unkn. Sh P1 12.500 P2 6.250 25.000 P3
 6.250 6.250 6.250 3.125 25.000 Total 100.000 100.000 100.000 100.000 100.000 190 1805
 18A 1901 1913 1916 wf 6n tw wf 6n tw wf 6n s Bf 6n tw Bf 6n tw Black Sh 25.000 25.000 P1
 12.500 P2 6.250 6.250 6.250 12.500 6.250 P3 9.375 9.375 9.375 6.250 6.250 White Sh 25.000

25.000 25.000 P1 26.000 25.000 25.000 12.500 25.000 P2 18.750 6.250 18.750 12.500 18.750
P3 9.375 3.125 17.625 12.500 18.750 Unkn. Sh P1 P2 12.500 P3 6.250 12.500 6.250 Total
100.000 100.000 100.000 100.000 100.000 Single Sh 25.000 P1 25.000 12.500 25.000 12.500
P2 12.500 12.500 18.750 18.750 18.750 P3 9.375 6.250 6.250 9.375 15.625 Twin Sh 25.000
25.000 25.000 26.000 P1 12.500 26.000 P2 6.250 6.250 6.250 6.250 P3 6.250 3.125 12.500
6.250 6.250 Unkn. Sh P1 12.500 P2 6.250 12.500 P3 9.375 15.625 6.850 9.375 3.125 Total
100.000 100.000 100.000 100.000 100.000 191 1922 1932 1934 19B 19C Bf 6n tw wf 6n s wf
6n s wf 7n s wf 6n s Black Sh 25.000 P1 12.500 12.500 P2 18.750 12.500 6.250 6.250 6.250
P3 3.125 3.125 15.625 9.375 9.375 White Sh 25.000 25.000 25.000 25.000 P1 12.500 25.000
12.500 25.000 25.000 P2 6.250 12.500 18.750 6.250 6.250 P3 15.625 17.625 9.375 3.125 3.125
Unkn. Sh P1 P2 12.500 12.500 P3 6.250 6.250 12.500 12.500 Total 100.000 100.000 100.000
100.000 100.000 Single Sh 25.000 25.000 25.000 25.000 P1 12.500 25.000 12.000 25.000 P2
12.500 18.750 12.500 12.000 12.500 P3 12.500 15.625 15.625 6.250 6.250 Twin Sh 25.000
P1 25.000 12.500 P2 12.500 6.250 12.500 P3 3.125 3.125 6.250 3.125 3.125 Unkn. Sh P1
12.500 P2 12.500 12.500 P3 9.375 6.250 3.125 16.625 15.625 Total 100.000 100.000 100.000
100.000 100.000 192 1505 1606 1706 1734 17B Bf 6n s wf 6n tw Bf 6n s wf 7n s wf 6n tw 2n
Sh P1 P2 P3 3n Sh P1 P2 P3 4n Sh P1 P2 6.250 6.250 6.250 P3 9.375 3.125 12.500 9.375 5n
Sh P1 12.500 P2 6.250 6.250 P3 6.250 3.125 3.125 6n Sh 25.000 25.000 25.000 25.000 P1
25.000 25.000 12.500 25.000 P2 25.000 18.750 12.500 12.500 P3 3.125 21.875 9.375 12.500
7n Sh 25.000 P1 P2 P3 8n Sh P1 P2 P3 Unkn. Sh P1 25.000 P2 25.000 P3 6.250 25.000 Total
100.000 100.000 100.000 100.000 100.000 193 1805 18A 1901 1913 1916 wf 6n tw wf 6n tw
wf 6n s Bf 6n tw Bf 6n tw 2n Sh P1 12.500 P2 P3 3n Sh P1 P2 6.250 P3 4n Sh P1 12.500 P2
12.670 6.250 12.500 P3 6.250 3.125 9.375 9.375 5n Sh P1 P2 6.250 12.500 P3 6n Sh 25.000
25.000 25.000 25.000 25.000 P1 25.000 12.500 12.500 25.000 25.000 P2 12.500 6.250 6.250
18.750 12.500 P3 12.500 9.375 15.625 18.750 15.625 7n Sh P1 P2 P3 8n Sh P1 P2 P3 Unkn.
Sh P1 P2 12.500 P3 6.250 12.500 6.250 Total 100.000 100.000 100.000 100.000 100.000 194
1922 1932 1934 19B 19C Bf 6n tw wf 6n s wf 6n s wf 7n s wf 6n s 2n Sh P1 12.500 P2 P3 3n
Sh P1 12.500 P2 6.250 6.250 P3 3.125 4n Sh P1 12.700 P2 6.250 6.250 6.250 6.250 P3 3.125
3.125 3.125 3.125 5n Sh P1 P2 P3 3.125 6.250 6n Sh 25.000 25.000 25.000 25.000 P1 25.000
25.000 12.000 12.500 12.700 P2 18.750 12.500 18.750 6.250 6.250 P3 15.625 9.375 18.750
9.375 9.375 7n Sh 25.000 P1 P2 P3 8n Sh P1 P2 P3 Unkn. Sh P1 P2 12.500 12.500 P3 6.250
6.250 12.500 12.500 Total 100.000 100.000 100.000 100.000 100.00 195

1909 Aug 31 SUMMARY OF BLOOD VALUES

Rams Black White Unkn. Single Twin Unkn. 17A wm 6n tw 18.8 56.2 28.0 31.2 47.8 25.0 1814
wm 6n s 15.6 84.4 75.0 18.8 6.2 1821 wm 6n tw 87.5 12.5 25.0 56.2 17.8 1824 Bm 7n s 74.4 ?
3.1 12.7 70.0 31.2 17.8 1836 wm 6n s 18.8 75.0 6.2 75.0 18.8 6.2 1903 wm 6n s 9.4 87.5 3.1

37.5 53.1 9.4 1912 wm 6n tw 31.2 62.? 6.3 40.? ?0.0 9.4 1917 wm 8n tw 12.5 87.5 34.4 62.5 3.1
1921 wm 6n s 37.5 62.5 81.2 12.5 6.3 1928 wm 6n s 1?8 75.0 6.2 68.7 21.? 9.4 1929 wm 6n tw
25.0 75.0 37.6 69.4 ?.1 1933 wm 7n s 6.2 93.8 75.0 21.9 3.1 19A wm 6n s 15.6 59.4 25.0 56.?
3.1 40.6 19D wm 6n s 15.6 59.? 25.0 68.8 3.1 28.1 Ewes 1505 Bf 6n s 59.4 34.4 6.2 62.5 25.0
12.5 1606 wf 6n tw 40.6 59.4 59.4 34.4 6.2 1706 Bf 6n s 56.2 43.8 65.6 2?.1 6.3 1734 wf 7n s
25.0 75.0 ?1.3 1?.6 3.1 17B wf 6n tw 2?.0 75.0 37.5 62.5 1?05 wf 6n tw 1?.6 78.1 6.3 46.9 37.5
16.6 18A wf 6n tw 15.6 59.4 25.0 31.3 28.1 40.6 1901 wf 6n s 15.6 84.4 75.0 18.8 6.2 1913 Bf
6n tw 56.2 37.5 6.3 40.6 50.0 9.4 1916 Bf 6n tw 37.5 62.5 34.4 62.5 3.1 1922 Bf 6n tw 59.4 34.4
6.2 2?.0 65.6 9.4 1932 wf 6n s 15.6 78.1 6.3 71.9 21.9 6.2 1934 wf 6n s 34.4 65.6 78.1 18.8 3.1
19B wf 7n s 15.6 59.4 25.0 56.3 3.1 40.6 19C wf 6n s 15.6 59.4 25.0 68.8 3.1 28.1 196 Rams 2n
3n 4n 5n 6n 7n 8n Unkn. 17A wm 6n tw 12.5 3.1 69.4 2?.0 1814 wm 6n s 34.4 6.2 59.4 1821 wm
6n tw 21.9 25.0 40.6 12.5 1824 Bm 7n s 12.5 21.9 28.1 25.0 12.5 1836 wm 6n s 6.2 3.1 84.4 6.3
1903 wm 6n s 28.1 15.6 53.1 3.2 1912 wm 6n tw 6.2 ?7.5 6.3 1917 wm 6n tw 9.4 12.5 53.1 25.0
1921 wm 6n s 25.0 6.2 68.8 1928 wm 6n s 6.3 3.1 6.2 78.1 6.3 1929 wm 6n tw 9.4 21.9 68.7
1933 wm 7n s 28.1 6.3 40.6 25.0 19A wm 6n s 12.5 9.4 53.1 2?.0 19D wm 6n s 9.4 12.5 53.1
25.0 Ewes 2n 3n 4n 5n 6n 7n 8n Unkn. 1505 Bf 6n s 9.4 6.2 78.1 6.3 1606 wf 6n tw 9.4 90.6
1706 Bf 6n s 18.7 21.9 59.4 1734 wf 7n s 15.6 9.4 50.0 25.0 17B wf 6n tw 25.0 75.0 1805 wf 6n
tw 18.8 75.0 6.2 18A wf 6n tw 12.5 9.4 53.1 25.0 1901 wf 6n s 34.4 6.2 59.4 1913 Bf 6n tw 6.2
67.5 6.3 1916 Bf 6n tw 9.4 12.5 78.1 1922 Bf 6n tw 6.2 3.1 84.4 6.3 1932 wf 6n s 6.2 9.4 6.2 71.9
6.3 1934 wf 6n s 3.1 21.9 75.0 19B wf 7n s 12.5 9.4 2?.1 25.0 2?.0 19C wf 6n s 12.5 9.4 53.1
25.0 197

SHEEP ARRANGED IN ORDER OF BLOOD-VALUE

6n blood Rams Twin blood Rams 87.5% 1912 wm 6n tw 62.5% 1917 wm 6n tw 84.4% 1836
wm 6n s 59.4% 1929 wm 6n tw 78.1% 1917 wm 6n tw 56.2% 1821 wm 6n tw 78.1% 1928 wm
6n s ??1% 1903 wm 6n s 68.8% 1921 wm 6n s 50.0% 1912 wm 6n tw 68.7% 1929 wm 6n tw
43.8% 17A wm 6n tw 65.6% 1933 wm 7n s 31.2% 1824 Bm 7n s 59.4% 17A wm 6n tw 21.9%
1928 wm 6n s 59.4% 1814 wm 6n s 21.9% 1923 wm 7n s 53.1% 1824 Bm 7n s 18.8% 1856
wm 6n s 53.1% 1903 wm 6n s 18.8% 1814 wm 6n s 53.1% 19A wm 6n s 12.5% 1921 wm 6n s
53.1% 19D wm 6n s 3.1% 19A wm 6n s 40.6% 1921 wm 6n tw 53.1% 19D wm 6n s 6n blood
Ewes Twin blood Ewes 90.6% 1606 wf 6n tw 65.6% 1922 Bf 6n tw 87.6% 1913 Bf 6n tw 62.5%
1916 Bf 6n tw 84.4% 1922 Bf 6n tw 50.0% 1913 Bf 6n tw 78.1% 1505 Bf 6n s 37.5% 1805 wf 6n
tw 78.1% 1916 Bf 6n tw 37.5% 17B wf 6n tw 75.0% 1734 wf 7n s 34.4% 1606 wf 6n tw 76.0%
1805 wf 6n tw 20.1% 1706 Bf 6n s 75.0% 1934 wf 6n s 28.1% 18A wf 6n tw 71.9% 1932 wf 6n
s 25.0% 1605 Bf 6n s 69.4% 1706 Bf 6n s 21.9% 1932 wf 6n s ?9.4% 1901 wf 6n s 18.8% 1934
wf 6n s 53.1% 18A wf 6n tw 18.8% 1901 wf 6n s 53.1% 19B wf 7n s 15.6% 1734 wf 7n s 53.1%
19C wf 6n s 3.1% 19B wf 7n s 25.0% 17B wf 6n tw 3.1% 19C wf 6n s

Under the heading "6n blood" are included all having six nipples or more. A.G.B.

198

REMARKS CONCERNING SHEEP TABLES

Aug.31 :— The present tables, pp179–197, contain a study of the tables, given on pp 135–148, relating to the ancestry of the multi-nippled sheep at Nursery. For an explanation of the contractions and symbols employed in the former tables see pp 149–153.

Study of ancestry of multi-nippled sheep: —pp 179–188. These tables show how many of the ancestors of the individual considered, were black, white, single, twin; and how many nipples they possessed.

Sh represents the sheep itself; P1 the first parents (father and mother); P2 the second parents (grand-parents); and P3 the third parents (great grand-parents).

The following examples will show the nature of the symbolisation employed:—

White Sh P1 P2 P3 1917 wm 8n tw 1 2 3 6

This shows that the sheep itself (Sh), both of the first parents (P1), three of the second parents (P2), and six of the third parents (P3) were white.

Twin Sh P1 P2 P3 1922 Bf 6n tw 1 2 2 1

This means that the sheep itself (Sh), both of the first parents (P1), two of the second parents (P2), and one 199 of the third parents (P3) were twins.

6n Sh P1 P2 P3 1606 wf 6n tw 1 2 3 7

The sheep herself (Sh), both of her first parents (P1), three of her second parents (P2), and seven of her third parents (P3) were six-nippled.

Blood values of the multi-nippled sheep pp 183–194: — These tables show how much black blood, white blood, single blood, twin blood, or multi-nippled blood is possessed by each sheep, on a percentage basis.

Whatever value we give to the blood of the sheep himself (Sh), we may assume that he owes one-half of his blood to each of his first parents (P1); one-quarter to each of his second parents (P2); and one-

eighth to each of his third parents (P3):— For he has two first parents (P1), four second parents (P2), and eight third parents (P3).

Limiting the enquiry to the four generations shown:— Full-blood would be manifested by the sheep itself, both of its parents, all four of its grand-parents, and all eight of its great grand-parents possessing the same characteristic. For example:— In a sheep of full 6n blood, the sheep itself (Sh), and all of the P1, P2, and P3 ancestors would be six-nippled.

Full-blood (to the P3 generation), we designate as 100%. Then the blood of the sheep himself would be valued at 25%. One of his first parents (P1), would be half of this, or 12.5%; one of his second parents (P2), one-quarter of this, 200 or 6.25%, and one of his third parents would be one-eighth of this or 3.125%.

If then the sheep possesses full-blood (say six-nippled blood) we would credit the blood values as follows:—

6n full-blood

1 Sh 25.0%

2 P1 25.0%

4 P2 25.0%

3 P3 25.0%

Total 100.0%

The tables of blood values, pp 173–194, give, upon this basis, the blood percentages for Sh, and for the P1, P2, and P3 ancestors.

Summary of blood values, pp 195–196 :— These tables give the summation of the blood values obtained in tables pp 183–194, for all the sheep. Take as an example the case of ram 1917 ?m 8n tw:

—
Black blood 12.5

White blood 87.5

Unknown

Total 100.00

Single blood 34.4

Twin blood 62.5

Unknown 3.1

Total 100.0

2n blood

3n blood

4n blood 9.4

5n blood 12.6

6n blood 33.1

7n blood

8n blood 25.0

Unknown

Total 100.0

201

Sheep arranged in the order of blood value, p 197: — This table enables us to see at a glance the sheep that have the largest proportion of six-nippled blood; and the largest proportion of twin blood. This table will undoubtedly be of assistance to us in making our selection for breeding purposes.

It should be noticed that, under the heading "6n blood", seven and eight-nippled sheep are included, in fact all having six nipples or more. It might perhaps have been better to have headed the column

"multi-nippled blood", only this designation usually includes 4n and 5n sheep whereas these are excluded from the table headed 6n blood p 197.

We have four seven-nippled, and one eight-nippled sheep; but none of their ancestors, so far as known, had more than six nipples. AGB

202

1909 Sept 1 A TRIP TO MARGAREE by J.G. Davidson

Aug.28 :— I left Beinn Bhreagh on Aug. 17 and joined the party in Baddeck for Margaree Forks to enjoy a week's sport salmon fishing. The day was fine and the journey was very enjoyable, farmers all along the route being busily engaged haying.

Farmers throughout Middle River district seem to be all prosperous by the extensive new buildings put up since we traversed that part of the country a year ago. Hay in general looks to be a fair average crop but pasture is exceptionally poor owing to the prolonged dry weather.

This year, same as in former years, in travelling through this fertile farming part of the country, it has always occurred to me what a great loss it is to the farmers in general not to endeavor to utilize some part of their farms in growing Turnips or Mangles to feed their stock during the long winter months; which, with a little extra labor would undoubtedly increase their incomes.

The scenery along the whole route is exceptionally fine, especially along the side of Harvard Lakes, which is something grand, the Lakes being close to the road on one side, and the steep mountain on the other side, with the native bushes, trees, wild flowers, and most gorgeous of all, the moss and ferns covering the rocks down the steep banks close to the gravel on the road, which in my eyes is the masterpiece of nature's landscape.

203

We arrived at Margaree Forks early in the evening, but in somewhat different mood from former years, as formerly we were no sooner alighted from the wagon than all hands were to work putting their rods together to get to the River. This year the river was so low, and all reports that very few salmon had been caught, dampened our ambitions.

After being received by the genial host, Mr. Dougal Campbell, who by the way is a character of the olden times when one gets acquainted with him, we were assured that we would be rewarded by getting salmon inside a week, as he had been praying for rain after he heard we were coming. He

was finished haymaking, and he said those who were not finished were too slow for the Lord to take notice of. This may or may not be the case.

Wednesday morning came, some of the party went fishing, I stayed around the house and rested as I felt pretty sure no salmon would be get that day, and true there were none.

Wednesday evening the 18th rain commenced to fall, and by 10 p.m. It was coming down pretty steadily and continued so throughout the night, and by Thursday morning the river commenced to rise. The water by this time had commenced to come in from the mountains, and by noon time the whole intervale was a solid sheet of water and for a time nothing but logs and hay was coming down the river. There was an enormous loss in hay reported.

I was shown one part of the intervale where a man had moved his hay the afternoon the rain came on, and did not put it in cocks, the result being when the flood abated, instead 204 of having hay, he had a good supply of old trees and all kinds of dirt .

The natives say it was the heaviest August freshet they have had for ten years, and some say the river rose ten feet but I hardly think so, though I would say by the appearance of the banks of the River, and the logs left all over the intervalles, that she certainly rose seven feet. It was a sight worth seeing.

Friday all hands were on the banks of the river early in the morning, as it came down fully quicker than she rose, but we were somewhat too early as no salmon were caught.

Saturday morning the river was in fine condition, but the salmon had not had time to get up as far as we were, and from nine rode which left in the morning from the house we put up in, only one salmon was caught, and that one fortunately by the writer.

I landed it about 9 a.m. and fished until 10.30 with no more success, back to the house, and it was on the table for dinner by 12.30:— I should say a quick dispatch. One more salmon was landed by the party in the afternoon.

Sunday was a day of rest and in our party it was observed as such, the only recreation being a walk along the river looking into the pool to see if we could locate salmon, but we failed to see any.

Monday, 23rd, all hands had breakfast by 6 a.m. and were on the banks of the river early, as the early bird catches the worm, the early fisherman has possession of the pool, and good sport was the success of the day in our party, 205 the writer landing two salmon inside of thirty minutes.

Tuesday, 24th, all hands early on the banks again, but it looked as if we had caught all the salmon the day previous, as only trout was the success of the day. Tempted by the prospects of more salmon coming in, we decided to stay for another day.

Wednesday, 25th, we were again early on the scene. This morning I had the second experience of losing a salmon, and by 8.10 a.m. I had lost two salmon. One I did not have on more than two minutes, the other I had on from 10 to 15 minutes, and it was playing very lively.

It had then made some long runs, and four rises of from five to seven feet clear of the water, after a long run in which it took at least sixty yards of line, when I commenced to reel in. My reel refused to work, and I had then too much strain on the fish, and the piece where it was hooked had given way, and I was left without my fish, but no broken gear, only the fish mouth had suffered.

One of our party landed a nineteen pound salmon this morning. In all, our party had eleven salmon to their credit, which we considered good, fish being so scarce. Had we been a week later I have no doubt but larger catches would have been on the program.

We left Margaree Forks in the afternoon in a pouring rain, and it rained all the way. I was surprised, on all the route from Margaree to Baddeck, to find the road was entirely free from damage by the freshet; and was astonished to see and hear the amount of damage done around here.

We all had a very pleasant and successful outing. JGD

206

The water-fall at Beinn Bhreagh Harbor after the rainstorm of Aug.18-19. Photo by Gilbert H. Grosvenor.

207

Melville Glen after rain-storm of Aug.18-19. Photo by Gilbert H. Grosvenor.

208

Damage to the road foot of Melville Glen. Caused by rainstorm of Aug.18-19. Photo by Gilbert H. Grosvenor.

Nearer view of the damage to the road. Photo by Gilbert H. Grosvenor.

209

The buckboard with new horses avoiding the break in the road at foot of Melville Glen. Photo by Gilbert H. Grosvenor.

The old House-boat on shore. Photo by Gilbert H. Grosvenor.

210

THE MOTOR-SLEDGE FOR DR. GRENFELL

Aug. 28:— A letter has been received here from Dr. Grenfell in reference to the motor sledge we propose to make for his use in Labrador. It is to be modeled upon the form of sledge employed by him with dog-teams; but is to be driven by an aerial-propeller worked by a gasoline motor, after the manner of the motor Ice-boat we had here last winter. To guide our efforts Dr. Grenfell has sent us a photograph of one of the Labrador sledges; and promises to send us a model.

In his letter, written on board the steam yacht Enchantress (see p 52) upon his arrival at Bonne Bay, Dr. Grenfell says:—

Aug. 2 :— Here is a photograph of my sledge. For stability I expect we shall have to have it much wider. This is made of hickory slats, and all lashed. I have told the maker to send you a model as soon as he can make one.

I have to thank you very much for your kindness to me, and also to thank Mrs. Bell. We had a beautiful run over to Bonne Bay.

I do not think it necessary to build anything for carrying patients. If they had surgical lesions, a slower and safer speed would probably be best; and, if a medical came, I think the extreme cold of going so fast through the air, would probably be prohibitive:—But, to take the Doctor to his patient, it seems to me it would be just invaluable.

(Signed) Wilfred T. Grenfell

The photograph of the dog-sledge enclosed with the letter, is reproduced upon the next page. AGB

211

Sledge used by Dr. Grenfell in Labrador. Enlarged from a small photo sent by Dr. Grenfell by J. McNeil.

212

BEINN BHREAGH LABORATORY

Details concerning Oionos model

Aug. 21:— Weight etc. of Oionos model, framework, surface, etc.

Framework only

Bottom frame = 1.969 kg.

Center frame = 2.670 kg.

Top frame = 1.907 kg.

Oblique frames (191 × 24) = 4.664 kg.

Total 11.130 kg.

Surface

Pure horizontal $1 \times (114 \times 533.4) = 6.0807$ sq m

Pure horizontal $2 \times (59.5 \times 57.25) = 4.5339$ sq m

Oblique $24 \times (68.25 \times 57.25) = 6.3766$ sq m

Total horizontal = 10.6146 sq m

Oblique resolved to horizontal = 5.0324 sq m

Total horizontal & oblique resolved 15.6470 sq m

Taking pure horizontal alone then ratio of weight to surface for the framework alone will be as follows:—

Ratio = $11.130/10.6145 = 1.048$ kg per sq m

Taking the pure horizontal and oblique resolved, ratio of weight to surface for the framework alone (see photo p 156) will be as follows:—

Ratio = $11.130/10.6146+5.0324 = 0.711$ kg per sq m

213

Now give the cloth 100 gms per sq m weight. Then weight would be $11.130+43.100 = 14.230$ kg (say 14 kg).

At 14 kg weight, reckoned on pure horizontal surface alone, ratio of weight to surface would be:—

Ratio = $14/10.6148 = 1.318$ kg per sq m

At 14 kg weight, reckoned on both horizontal and resolved oblique surfaces ratio of weight to surface (of course for the whole wing piece including cloth surfaces) would be as follows:—

Ratio = $14/15.6470 = 0.894$ kg per sq m

WFB

Aug 23:— I forward details concerning experiments on the Bay today with the model Cygnet II. Only one set of readings obtained. WFB

Aug 24:— I forward details of six experiments on Bay today with the Cygnet model. Only four complete sets of readings obtained. WFB

Aug. 27:— We loaned the Get-Away to the Canadian Aerodrome Company today to transfer their lumber for the construction of their aerodrome shed up the Baddeck River. WFB

Aug. 27: — All the wiring on the Oionos model is finished, and we will take the framework apart and put on the cloth covering at once. WFB

Aug.27:— We have a man at work cleaning up the hydro-surfaces and engine on the Query, preparatory to making 214 further experiments with her. WFB

A correction

Aug. 28:— All the readings of pull taken in kilograms in kite experiments before this date will have to be multiplied by 2, as the observer mis-read the scale. WFB

Aug. 30:— Received word at four o'clock from Dr. Bell to fly the upside down pure tetrahedral kite, if wind enough. Immediately took wind velocity in kite field and got only 6.5 mph. Wind from the North and puffy, so decided better not try kite. WFB

Steamer Blue Hill to tow Cygnet II

Aug. 31: — Was over to town this afternoon, and saw Mr. Sutherland, a Director of the Blue Hill Company, and arranged with him concerning the Laboratory having the Blue Hill for kite flying purposes.

He said that the terms of the arrangement made in 1907 would be satisfactory. These terms were Five Dollars an hour, or any part thereof. McC

215

CANADIAN AERODROME COMPANY

Device to prevent wires breaking from vibration

Aug. 11:— In reference to McCurdy's telegram from Petewawa (p 94) the meaning is this. Instead of threading diagonal wires thus have them with eye-bolts thus.

This gives them play to prevent breaking with vibration. The former way was used in Baddeck No. I. KI

Searching for a testing ground for aerodromes

Aug. 24: — Baldwin and McCurdy, accompanied by Mrs. Bell, Mrs. Baldwin, Mrs. H. A. Grosvenor, and Gertrude Grosvenor started in the Gauldrie for intending to go to Nyanza and examine the proposed testing ground from the Baddeck River. There was not time enough for the Gauldrie to go to Nyanza and return before her regular evening trip, so they sent the Gauldrie back from Baddeck and took another motor boat there.

AGB

Aug. 24:— Drove over to Big Baddeck Valley on Saturday (Aug. 21 see p 171) to find suitable flying grounds.

First drove down the South-east side of the river. 216 It was fair for hops, but a turn could not be negotiated.

We then drove round to the other side of the River across the Red Bridge and inspected the Bentick Farm Interval. They have there about 300 acres of ideal ground, flat as a table, and entirely cleared of trees, or obstructions of any kind.

Sandy McRae, the owner, said that he would be glad for us to use it in any way we wished; but, before making any arrangements with him, we thought it advisable to have Mr. Bell to look the ground over.

It seems that we could bring the machine all the way by water in the Get-Away, going up the River from Nyanza Bay right to the grounds.

This statement we propose to verify today (Aug. 24), and so a party was arranged to take the Gauldrie, and make the attempt to motor to the grounds by water. We finally got away in McFarlane's boat but we failed to negotiate the mud flats at the river's mouth. An attempt will, however, be made with a different boat later on in the week. McC.

Suitable testing ground found

Aug. 26: — Took the Gauldrie this morning to explore the Big Baddeck River, with the idea in view of taking the machine up to the Bentick Farm.

Ingraham, Murdoch and myself left here about 10 o'clock, and got a set of batteries in town, leaving there about eleven o'clock.

217

It took about one and a half hours to arrive at the mouth of the River; and then we decided to stop, and Ingraham and I took the dory to find the channel.

That was a difficult job as the deep water winds this way and that. Finally, however, we located it; and then to our surprise found that, while we were absent, the Gauldrie's ?ow had run on a log, and remained hard and fast.

We tried various means of getting her off; and finally had to jump overboard, and by means of two pri?s dislodged her.

We then made good time to the Bentick Interval and arranged with Sandy to put up a shed, and use the ground for the rest of the Season for Ten Dollars. We then started home and arrived at BB at six o'clock. McC

Aug. 27: — Arrangements have just been made whereby we can use three hundred acres of interval land on the Bentick Farm, Big Baddeck, for a flying ground; and preparations are now being made for the construction there for an aerodrome shed.

It is a comparatively easy matter to transport a fully assembled machine, from our factory to these grounds, by water all the way. The machine being placed on the Get-Away at Beinn Bhreagh can be towed by the Gauldrie up through Nyanza Bay to the Big Baddeck Bridge (lower) where, after making a short portage of about twenty feet to negotiate the bridge, the Get-Away can proceed with the machine directly to the shed by the river's bank. In about two weeks we hope to be encamped there with Baddeck No.II. McC

218

Aug. 27:— Had the tilting arms removed from the deck of the Get-Away this morning. This afternoon the Gauldrie took the Get-Away in tow and collected all the lumber required for the shed to be built at the Bentick Farm.

The Get-Away will be left in town over night, and in the morning, after the Gauldrie's regular trip, will be towed up to Hyan?a Bay, and up the River to the grounds; the Gauldrie returning to Beinn Bhreagh in time for her evening trip.

McC

Aug. 29: — Get the lumber for the shed to the Bentick Interval O.K., and all landed, and home again before five o'clock. Arranged to have work started there on Monday morning (Aug. 30). The lumber was taken up Saturday. (Aug. 28)

McC

BEINN BHREAGH .**Alfalfa Experiments .**

Aug. 2? :— In the Spring of 190?, I tried the experiment of growing Alfalfa in part of the new field recently taken from the woods and cultivated.

I had purchased some seed from . & Co. Toronto; and I also received, from the Department of Agriculture of Washington, D.C., through Mr. David G. Fairchild, some seeds which were supposed to be Siberian Alfalfa and ?ardy.

The two sets of seeds were separately and watched with interest, there being a cover crop of oats with the Alfalfa. The distinction between the two sets, although observed last summer, could not be so readily defined especially by one who was having his first experience in growing Alfalfa.

This Spring the difference was easily seen; and I made a report to the Department at Washington, also sending samples of the products from the different sets of seeds.

The following is the reply received from the Bureau of Plant Industry, U.S. Department of Agriculture, Washington D.C.:— your letter of July 23rd.

Aug. 2 1:—Upon my return from an extended trip I find that Mr. Fairchild has ref?rred to ?

220

The plant you sent in from our plot is certainly red clover, and that from R?nnie's is Alfalfa.

It is possible that there was a mistake in our office somewhere. The Alfalfa we intended to send you was No. 21217.

(Signed) J M Westgale, Agrenomist

I also shared some of the Agricultural Department's s?eds with Mr. Manchester, Supt. of the Farm Department, and I am under the impression he did not even got a crop of red clover, as he re-
ceeded it this Spring. JGD.

BEINN BHREAGH FARM DEPARTMENT .

Aug. 23 :— Mr. Manchester left Beinn Bhreagh this afternoon for Halifax to meet the Zulu Sheep. AGB.

Aug. 24 :— The following note has been received from Dr. Howard McFatridge, Veterinary Surgeon, Halifax,. N.S:—

Aug. 24:— Your man (Mr. Manchester called on me in reference to your shipment of sheep now due by S? Mongolian. I have informed him that it will be necessary for those sheep to go into quarantine for a period of 30 days to date from clearance of vessel from Great Britain, as per section 27 of the Animals Regulations of Quarantine.

As he was not aware of that fact he asked me to write you and let you know of it. Your sheep, while in Quarantine here, will receive the best of attention and care, and will be sent forward promptly on expiration of Quarantine. Hoping this will be satisfactory etc.

(Signed)H.?. McFatridge, V.S. Inspector.

221

Aug.26 :— The following letter has been received from Mr. Manchester from Halifax, N.S:—

Aug. 25: — The Ste?er Mongolian does not arrive here until to-morrow the 26th.

I was to ?ee H.S. McFatridge, V.S., Inspector of Live-Stock, and he said, that the sheep would be in Quarantine 30 days from clearance of ste?er from Liverpool, so by that they will be here until the 13th of Sept.

While speaking to the Agent of the Allen Line he said, that he thought that you would be able to shorten Quarantine period by applying to Authorities at Ottawa.

If the sheep are to remain here until the 13th of Sept. what had I better do. Dr. McFatridge said that he wo?ld see that they received the very best of care, so I think after I have seen them safely landed in comfortable quarters and with plenty of food to last them, that I had better leave for Beinn Bhreagh.

(Signed) Percy Manchester.

Aug. 27 :— I telegraphed Manchester yesterday to make the best arrangements he could for the sheep and return home. AGB.

Zulu Sheep arrive in Halifax.

Aug. 29 :— I hear that Manchester arrived at Beinn Bhreagh last night (Aug. 28) from Halifax; and that the sheep arrived O.K. and are left at Quarantine for the present. AGB.

Aug. 30 :— Your flock of 23 Zulu sheep, shipped on steamer Mongolian from Liverpool on the 17th, did not arrive in Halifax on Wednesday the 25th as was expected, but on the following morning (Aug. 26).

222

They are looking very well, and in good condition with the exception of two or three; particularly well when you consider their close confinement during their long voyage across the Atlantic.

“Admiral Anson”, the four year old ram is a very intelligent looking animal, with beautiful large long horns, and I think with very little training would make an excellent boxer.

The flock was very much admired by those that saw them, but not having seen sheep with four horns before, they were very naturally mistaken for goats.

On arriving in Halifax I went to see Dr. McFatridge, V.S., Government Inspector of Live Stock, and he informed me that the sheep would be Quarantined for 30 days from time of clearance of steamer from Liverpool, so that will bring it to the 13th of Sept.

They were taken to the Quarantine grounds on the day of their arrival. The grounds and buildings are about a mile and a half out of the city. The building is comfortable and well ventilated, but the grounds are rather small to afford them much pasture. However, before leaving, I had plenty of food sent out, and got a man to look after them. Dr. McFatridge said that he would see that they received the very best of care and attention.

(Signed) Percy Manchester.

222 ½

DEPARTMENT OF BUILDINGS & WHARVES .

Aug. 12 :— I am preparing plans etc. for remodelling the Crescent Grove boat-house to be occupied by Mr. Frost and family as a summer residence. Mr. and Mrs. Frost called at the office to-day to note the progress of the above plans. CCB.

Aug. 12: — We are starting to make the third float for the "Ugly Duckling" house-boat, with a plate of glass in the bottom. CCB.

Aug. 12 :— Will start at re-painting the tetrahedral tower to-morrow, if weather permits. CCB.

Aug. 25 :— Sam McMillan, after gathering the hay upon his farm at Big Baddeck, came back to work Tuesday morning (Aug. 24). CCB.

Aug. 26 :— We burned out the crematory Monday morning (Aug. 2?) with good results, although a space of nearly three weeks had elapsed since the previous burning.

CCB.

Aug. 30 :— Capt. McDonald informs me that since launching in the Spring he has covered about 1500 miles with the Gauldrie, which is not bad for an old engine.

CCB.

Aug. 30 :— We are hauling up the "Ugly Duckling" house-boat to-day for placing third float under her. CCB.

223

LIST OF EXPERIMENTS AUG. 22-2? .

Aug. 23 :— Cygnet model flown on the bay. Only one set of readings obtained before the kite came down on the water on account of lightness of wind. Kite was picked up by the "Get-Away" uninjured. AGB.

Aug. 24: — Cygnet model flown on the bay. Six experiments were made but Mr. Bedwin obtained only four complete sets of readings. Twice the kite came down into the water on account of lack of wind interrupting the readings, it was thought best to postpone further experiments. AGB.

BEINN BHREAGH ITEMS AUG. 22-28 .

Aug. 24 :— Miss Anna Urquhart left this morning for a visit to her home at Foly Village, M.S. to see her sister who is just recovering from a severe illness. C McL.

Aerodrome Co. beats the Lab .

Aug. 24 :— The great first Quoit match of the season on Beinn Bhreagh was played at the Laboratory grounds last evening, resulting in a decided victory for the Aerodrome Co's team. The scoring was as follows:—

Score.

McLean 50 5 woods

Rudderham 49 5 woods

Ingraham 100 23 woods

Ross 31 7 woods 1 le?ner

Terms:— For Lab. J. McLean and A. Ross; for Aerodrome Co. W. Rudderham and K. Ingraham. W?B.

224

Aug.25: — Le Roy J. Bedwin, four year old son of W. F. Bedwin, Supt. Lab., is suffering from a rheumatic inflammation of the ankle. Dr. McDonald found it necessary to put the leg in a plaster cast on Sunday (Aug. 22). The little fellow is somewhat better this morning. WFB.

Aug. 25: — Mr. Stewart was obliged to go home from the Lab. this morning suffering from a very severe billions headache. WFB.

Aug. 26 :— Mr. and Mrs. Richelberger from Washington, D.C. arrived at Beinn Bhreagh to-day as are guests at the Lodge. AGB.

Aug. 26 :— Concert at Beinn Bhreagh Hall this eveing. Mr. Ca?ot McCurdy of Sydney gave ?olon on the plane. Music and singing by Mrs. Baldwin, Mrs. Frost, Mr. Douglas McCurdy and Mr. Graham Bell. Dr. Bell sang some se?tch . Among these present were:— Carnet McCurdy, Miss MacRae

of Washington, Mrs. Baldwin, Miss McIntosh, Miss Lissie McLean, Miss Campbell, Mr. and Mrs. Lumsden, Mrs. Campbell, Mrs. W. F. McCurdy, Miss Georgina McCurdy, Miss Mabel McCurdy, Mr. Douglas McCurdy, Mr. W. F. McCurdy, Mr. and Mrs. Michelberger, Mr. and Mrs. Gilbert M. Grosvenor, Mrs. Edwin A. Grosvenor, Miss ?live Stairs, Miss Dorothy Stairs, Mrs. Blanchard, Mr. and Mrs. James Frazer, Mr. McKay, Miss Ingraham of Clac? Bay, Mrs. Decker, Miss Vivian Ross, Miss MacRae of Baddeck, Miss Louise Buchanan, Miss Annie Buchanan, Miss Mary Buchanan, Mrs. Anderson, Mr. Calkin, Mr. W. MacAskill, Mr. and Mrs. Walter Frost, Dr. and Mrs. Bell.

AGB.

225

Aug.26 :— Mr. H. S. , commercial traveler of Yarmouth, ?S., spent part of Saturday and Sunday (Aug. 21–28) here. He was greatly impressed with Beinn Bhreagh and the various works upon the place. CCB.

Aug.27 :— Baldwin's new tender the " ", arrived at the Lab. yesterday, and we stuck the engine in her at odd moments. He a 2 ?P. Roberts 2 cycle engine, but so far the thing has acted four cycle in spite of all we can do. Just come little thing wrong. WFB.

Vis term at Laboratory .

Aug.27 :— The following visitors have registered at Laboratory:—

Aug. 24, Miss . Bonnet, and Mrs. A W. Bonnet of ; Mrs. Stanley Robinson of Stanley Robinson of Washington, D.C.; Miss Bessie Emile Doli??e, and Mr. Eugene , of St. Piarre; Mr. and Mrs. M.M. of Ottawa.

Aug.27, Mr. and Mrs. Frederick ??chelberger of Washington, D.C.?. WFB.

Aug.27 :— Motor boat race in Baddeck last evening resulted in a for the "Qui Vive". The " " come in first, but she over her allotted time by five seconds. This makes two wise for the "Qui Vive". WFB.

226

THE OF XYZ .

A Fine Exhibition of Seamanship .

Aug.2? :— I heard an interesting tale this evening concerning the attempts of a well known Beinn Bhreagh yacht to make her moorings to-day. The observers, on the other side of the bay recognized the boat by her speaker sail, and watched the performance from their verandah through their glasses.

Four attem?ts were made, all of which were too short. The fifth time the yacht seemed determined to get a hold of the cork float anyway, and it was grabbed and brought on board. The sea was running fast and the wind was quite high, and naturally the one half inch line attaching the b?oy to the heavy mooring line broke, and the mooring dropped to the bottom.

The yacht then round, and her tow-boat being in the way, was simply run down and s?nk. The yacht passing over her victim.

The skipper must have then yelled to let go the sheet quickly, for out went the mainsail, the sheet un-reaving, leaving the yacht with a ?unken tow-?oat at her , and a flopping sail, and the wind and sea in full charge.

The observers then telephoned to Beinn Bhreagh, and finally word was sent to the Gauldrie and she arrived on the , and towed her round into Harbor. XYZ.

227

1909, Sept.1, Another Chest on Beinn Bhreagh.

Aug.30 :— Another mysterious occurrence was observed on Beinn Bhreagh last Wednesday night (Aug. 25). Mr. Ang?s McKensie, and others in Baddeck, looking over towards Beinn Breagh observed a light apparently on the top of the tetrahedral tower. The tower itself was not visible but Mr. McKensie knew its location. Looking out, a few minutes afterwards Mr. McKensie saw the light at a considerable distance above the tower, and was assured by others that it rose into the air like a Japanese lantern attached to a balloon. While the observers watched, the light seemed to and then suddenly died away as though a lighted balloon had burst in the air. It could not have been a star because, according to Mr. Rory McKensie it was observed also on B?ulamarie Island apparently at the top of the tower.

As no one on Beinn Bhreagh knows anything about visitors to the tower on Wednesday night, it is, obvious that no visitors could have been there.

Perhaps it was a ghostly apparition giving warning of a disaster to a balloon instead of a flying machine. In this connection it is interesting to note that about the same time an accident happened to a war balloon in France, which was being held by French soldiers during a heavy breeze. During a squall the balloon stayed over and struck the ground and burst like the light on the tetrahedral tower. By making sufficient allowance for a difference of local time, the two events happened exactly together. XYZ.

228

Sept 4, 1909 THE RADIATOR OF BADDECK NO. I

Sept. 6: — I have been urging upon Mr. F. W. Baldwin and Mr. J. A. Douglas McCurdy the importance of preserving dated records concerning the development of new details of construction in the aerodromes they are building. I am afraid they are too much in the habit of merely going ahead with the details themselves without realizing that perhaps, years after this, they may be called upon for proof of,

1. When and where important details were first conceived, and
2. When and where they were first reduced to practice.

More recollection cannot be relied upon after the lapse of years. Some dated documentary evidence of invention should exist, or some model, the date of construction of which is marked, should be preserved.

There are several new features about the aerodrome, Baddeck No. I, which may turn out to be of considerable importance. Take for example, the radiator which seems to me to be an improvement over other radiators used on other aerodromes. Other radiators, so far as I know, offer considerable resistance to passage through the air, and constitute mere dead load to be carried by the machine. In Baldwin and McCurdy's Baddeck No. I the radiator offers very little resistance to advance through the air; and the blades of the radiator, being curved like the main supporting surfaces of the machine, have a lift of their own sufficient to support their own weight, or at least to support a considerable portion of it, so that the radiator as a whole is no load on the machine.

Here then is an importance improvement, and I asked Baldwin and McCurdy what records they had to show when and where the idea of this radiator was conceived and when and where the invention was first reduced to practice.

Although no very great time has elapsed since the first conception of this idea, I found their recollection vague as to first conception and the documentary proof of conception bearing a date very much later than that to which I think they are rightfully entitled.

In addition to their private notes I found that they had in their possession a letter dated May 12, 1909 to Mr. Roberts, of the Roberts Motor Co. of Sandusky, Ohio, describing, with drawings, their radiator before its actual construction. I have therefore asked them to hand over to me the original letter written May 12, for preservation among my own records, out of their own possession, marking it with the date of receipt by me, namely August 31, 1909. This letter, although it does not carry the matter back to the date of first conception is still important as a documentary description of the idea before its first reduction to practice.

With the permission of Messrs. Baldwin and McCurdy I place in the Recorder a copy of this letter, together with photograph of the drawings accompanying it. At my request Mr. Douglas McCurdy has written a prefatory note explaining how the letter came to be written and why it was not sent to Mr. Roberts

AGB

230

Prefatory note by McCurdy

Sept. 3: — Knowing what Mr. Roberts of the Roberts Motor Co. of Sandusky, Ohio, was with Sir Hiram Maxim at the time he constructed his flying machine, and that Mr. Roberts would therefore be familiar with the details of construction of the condenser used with his steam engine, we asked him by telegraph if he would undertake to design and construct a m?itable efficient radiator for use in Baddeck No.I

Mr. Roberts replied that he would draw up a design for \$50.00 and named a shop where we could have it constructed.

Casey and I then talked the matter over and decided to accept his proposition, but thought it advisable to send him a sketch of the machine showing where we considered it most advisable to place the radiator and, if so placed, how it might be constructed to the best advantage.

Before we came through talking the idea suddenly struck us that, we were so full of ideas, why not design and construct the radiator ourselves.

The drawings and letter to Mr. Roberts were therefore never sent and we set about the construction and design ourselves and produced the radiator used in Baddeck No.1 in our own factory.

The accompanying letter and drawings are those referred to above, and at Mr. Bell's request I have written this explanation as a preface to the letter and drawings. J.A.D. McC.

231

Copy of letter written to Mr. Roberts but never sent

Baddeck, C. B., May 12, 1909. E.W. Roberts, Sandusky, Ohio. Dear Sir:—

Your telegram of May 11th concerning radiator received.

We think that it would be advisable to leave the space in the center panel open, for it is there where the passenger must sit - directly behind the operator.

I am enclosing a rough sketch showing where we think radiator should be attached and if you can design, so as to fit and be efficient, placed as shown in accompanying drawing we would be very glad if you would go ahead and prepare design.

The engine develops 40 horse normally but will at times be run at higher speed when she will develop 50 horse, so it would therefore be necessary to provide sufficient capacity and surface to take care of the maximum power.

I wrote to the firm you suggested, about making up this special radiator and they replied that it would be impossible for them to do any special work before the middle of July.

We are, as you perhaps know, in a great rush and could you again suggest the name of some other firm who would be competent to undertake the construction work.

Would it be possible for you yourself to have it made 232 in your factory. This would to us be the most satisfactory arrangement and we would beyond doubt stand a much better chance of getting it on time.

Yours truly, (Signed) Baldwin & McCurdy.

233

Sept. 8, 1909

One of the rough sketches of the radiator of Baddeck No.I made by Baldwin and McCurdy May 12, 1909 and enclosed in their letter to Mr. Roberts written May 12, 1909 but never sent (see pp 231–232). Photographed from the original by J. McNeil.

234

Another rough sketch of the radiator of Baddeck No.I made by Baldwin and McCurdy May 12, 1909 and enclosed in their letter to Mr. Roberts written May 12, 1909 but never sent (see pp 231–232). Photographed from the original by J. McNeil.

235

Sept. 7, 1909 THE CURVED BOW CONTROL OF BADDECK NO.I by F.W. Baldwin

Sept.5: —The first thing I did after returning from Petewawa was to have a good long look at some photographs of the Dart and June Bug in the air, to reassure myself that they really did fly satisfactorily.

The next thought was naturally to enquire why our new machine, Baddeck No.I, which is so superior to them in most respects, failed to fly as well at Petewawa.

It is hopeless to try and record all the discussions we have had upon the subject.

Carrying capacity, and speed, for the present seem minor considerations; and anything that looks like automatic stability, ease of handling, etc., even to the extent of sluggishness, looms up large.

The curved bow-control was a departure in Baddeck No.I, and one which, I think, we must admit was a mistake under the existing circumstances.

While it may, or may not have caused the accident to Baddeck No.I, it undoubtedly made the machine more sensitive. A tailless aerodrome with a curved bow-control is about as sensitive a model as we can possibly build.

In our efforts to improve the safety of the machine, I think we are wise in going back to a tail, and plane controls. FWB

236

VERTICAL STEERING by A.G. Bell

Sept.6:— The accident to Baddeck No.I has led me to think a great deal about the operation of a front control; and I am decidedly of the opinion that a front control, without any balancing horizontal surface at the rear, may become a dangerous feature in a machine. If we must have only one control for vertical steering, let it be at the rear, and not in front.

The location of the control, whether at the rear or in front, may perhaps be immaterial so far as vertical steering is concerned, so long as the machine advances in the direction of the propeller thrust:—But it only does this when the propeller thrust is substantially horizontal.

When the head is turned up, as in the case of Baddeck No.I, the action of gravity causes the line of advances to be more nearly horizontal than the direction of the propeller thrust; and in such a case the wind of advance pushes the front control upwards, and tends to upset the machine backwards to bring the front control to the rear. That is the tendency, whatever the actual action may be; and we have to fight against it by moving the control.

If the departure from the horizontal position is slight, we may meet the case by changing the angle of the control; but if the departure is considerable, as in the case of Baddeck no.I, no motion of the front control could possibly bring the 237 machine back to the horizontal: For, even though the front control should be depressed, so as to make the greatest possible negative angle with the longitudinal axis of the machine, the surface of the control would only be parallel with the actual line or advance, and it could not then steer the head down.

How contrast the upsetting tendency of a front control, with the stabilizing tendency of a horizontal surface at the rear.

Let there be a horizontal tail, and as front control:—The very opposite of what we now have. The tendencies then too would be opposite.

When the longitudinal axis of the machine is inclined upwards or downwards to the actual line of advance, the wind of advance, acting upon the tail, tends to restore the machine to the horizontal position: Whereas, if the surface is in front, it tends to make it depart still more from the horizontal position.

Hence, a horizontal tail at the rear is a much safer proposition than a front control.

Should headway be lost in the air, and the machine descend towards the ground without lateral translation, a dro?e having only a front control, or only a horizontal tail, would find itself in a dangerous predicament. The upward wind, due to descent, acting upon the ex-centric horizontal surface would push it up relatively to the machine; so that the dro?e would turn in the air, head down, or tail down as 238 the case might be. Under such circumstances the horizontal tail would cause the machine to fall head down; while a front control ? w ould turn it tail down in position for a back dive. In both cases there would be a tendency to depart from the horizontal position in falling.

I would submit that it is safer to fall head down than tail down, because st ?? ?? rage ? a ny would be regained by falling forward if there is room enough to fall without touching the ground. A horizontal tail would secure this point; but a front control would produce a backward dive.

Now suppose that we have both a front control and a horizontal tail:— Then the machine would depart less from the horizontal position in falling without headway, than with either control alone: The opposite turning tendencies balance one another.

If the tail surface is slightly larger than the front surface, we secure a slight residual tendency to a head dive; and this is consistent with the safe recovery of steerage way.

I would therefore say:—Let us have both a front control and a horizontal tail; and let the surface of the tail be slightly greater than the surface of the front control.

AGB

239

HORIZONTAL STEERING by A.G. Bell

Sept. 6: — I have already all?ded to certain inherent disadvantages involved in the use of a vertical rudder for horizontal steering, and have suggested that we might do away with the vertical rudder

altogether, and substitute separately moveable lateral rudders at the ends of the wing piece. (See pp 17-20).

The objection occurs that this is only a theoretical means of steering not yet tested in actual practice; whereas steering by a vertical rudder is in actual use upon every practical machine. In making our first trials with our new machines, not let well enough alone, and use a vertical rudder merely remedying its disadvantages as well as we can. Why not use the old contrivances that we know will work, until after we have got the machine safely into the air, and have obtained some practice in flying with it. Why not rather "bear those ills we have, than fly to others that we know not of". It will be time enough to branch out and try new methods of horizontal steering after we have got safely into the air.

While I must say that my preference could be to discard the vertical rudder altogether, I recognize the wisdom of conservative proceedings. Let us then see how far we can remedy the disadvantages of the vertical rudder.

If we use a fixed vertical surface in front, to balance the vertical rudder at the rear, this will prevent the machine from swerving from its path under the action of side winds; but it will not prevent the more serious tendency of the machine to dive when turning in the air.

When the machine makes a turn to one side or the other, the wing having the shorter radius of curvature dips down, so that the vertical rudder is no longer vertical. Under such circumstances the rudder steers the head down as well as to one side, thus tending to produce a dive.

The cause of the action lies in the depression of one wing relatively to the other while turning in the air. Anything therefore which will lessen this tilting tendency, will also lessen the danger resulting from the use of a vertical rudder for horizontal steering.

Now suppose that the vertical rudder at the rear, and the balancing vertical surface in front, are both placed somewhat above the general level of the machine.

Under the action of side winds, the machine would then lean over to one side, like a ship sailing on the sea. This kind of action, however disadvantageous from one point of view, would be distinctly advantageous from another; for it would oppose the tilting action produced during a turn, and thus lessen the tendency of the vertical rudder to produce a dive.

When a sail boat is in danger of tipping over during a squall it can head up into the wind's eye, and thus lessen the pressure of the wind upon the sails. The drogue too could perform this kind

of manoeuvre in the air; but it can also oppose the tipping action directly by the use of its lateral rudders.

241

Even as at present arranged, the tilting action produced during a turn could be lessened, or neutralized by the use of the lateral rudders; and I presume that the experienced aviator really use them, in combination with the vertical rudder in making a turn.

This, however, is a process involving thought; whereas, if the vertical surfaces extend more above the center of the machine than below, the remedy is applied automatically.

In conclusion I would say that if we use a vertical rudder for horizontal steering, we should have an equal vertical fixed surface in front, and in both cases the surfaces should extend more above the center of the machine than below.

AGB

CANADIAN AERODROME COMPANY

Progress of Baddeck No. II

Sept.5:— Soon after coming home from Petewawa, Baddeck No.II was balanced up, and her center of gravity located with the engine in the same position as in Baddeck No. I. It came just 19 ½ inches back from the front edge of the surface.

Now to make things the same as in the Silver Dart and June Bug, this point should be about 10–11 inches back.

To change the center of gravity to this point the engine would have to be moved forward about two feet, which would bring the balance wheel forward of the front chord. Such an arrangement would be inconvenient.

We talked the thing over, and finally decided to use a curved tail supported 10 feet out in the rear. This additional surface placed at an angle of 4° would produce a lift which would bring the center of pressure about over the center of gravity with the engine placed as in Baddeck No.I.

On considering the action of the curved front control the fact was revealed that a sudden increase of the angle from any zero° or -2° to say +4° would suddenly throw in a leverage of about 1500 feet-pounds; which would, unless looked to very smartly, cause a very sudden turning upwards of the machine, and if the correction was delayed until the critical angle of the machine was passed, nothing would bring the machine back on an even keel again.

Now this may be what happened to the Baddeck No.I. We are therefore going to go back to our flat control.

The Baddeck No.II will therefore be more like the June Bug, having a tail and flat control. McC

Return of Baddeck No.I

Sept.5:— Baddeck No.1, with engine, arrived at Baddeck, Friday (Sept.3), and the engine was transferred by Gauldrie to the factory that afternoon.

On Saturday morning (Sept.4), the Gauldrie towed the Get-Away to Baddeck, and the whole shipment was brought to Beinn Bhreagh.

243

The shed at the Bentic Farm is almost finished, and will be ready for the reception of the machine (Baddeck No.II) by Thursday, Sept.9. McC

BEINN BHREAGH FARM DEPARTMENT

Crops

Sept.6:— We did not finish having until Wednesday, Sept I The wet disagreeable weather we have been having very much delayed us, otherwise we would have finished about two weeks earlier.

Although the hay crop here was very good, the mountain hay was a very poor crop only cutting about eight tons. In all, I would say we have harvested about seventy-six tons, which I consider very good considering the poor crop harvested throughout Cape Breton.

Although the weather still looked unsettled, I thought it advisable to now down the barley, for it was too ripe to leave standing any longer. If the weather still keeps fine, we will h??l it into the barn on Monday. PW

Roads

Besides the work done on the farm the past week, we have also done considerable work on the roads; filling in the deep trenches that were dug out by the previous rain storm, besides building a bridge, and filling in trenches, on the section road beyond the Entrance Gate.

244

Zulu Sheep

Sept.6: — A letter received from Dr. McFatridge, V.S., of Halifax, on Friday evening the 3rd contained and news in regard to the flock of Zulu sheep, which are now in quarantine in that City and which are under Dr. McFatridge's care. The flock are affected with dysentery, and one of the rams that Dr. Bell prized very much died. Dr. McFatridge reports the rest of the flock on the road to recovery.

I sent the following telegram to Dr. McFatridge on Saturday, Sept.4, at 10 a.m.:—

Sept.4:— If it was one of the long-horned rams that died, Dr. Bell would like his head preserved by P.J. Bagan of Halifax. Please attend to it.

(Signed) Percy Manchester

Sept.4: —Dr. Bell sent the following telegram to Dr. McFatridge to-day:—

Sept.?: — Could send man right up to Halifax to look after sheep if you think desirable, but Manchester himself will reach Halifax Sept.12. Want head of ram properly preserved and mounted by Hagen of Halifax. If not in condition for this, want skull and horns preserved and mounted. Kindly send telegram collect as to condition of flock.

(Signed) Graham Bell.

The following reply has been received by Dr. Bell:—

Sept.4:— All flock well except old ram who is pretty sick. I am carrying out your instructions about mounting head. Have man in charge of sheep.

(Signed) S. H. McFatridge.

245

Saving Land at ?? Harbor

Sept.6:— For the past two years experiments have been made to save the tongue of land at Beinn Bhreagh Harbor.

For this purpose young spruce bushes of from five to twelve feet tall which had been cut down from pasture land, were put to use. The bushes were laid in the water at an angle of about 45° with the shore line, and then staked down, so as, if possible, to prevent the wash of the sea from moving them away.

This method of saving the land has been very successful; for it has not only protected it from being washed away, but these small trees have collected the sea-weed and the sand and the gravel in their branches, so that in one place in particular (near the point), the beach is fifteen feet wider. This is where they have done their best work.

There are now a few gaps that need repairing. It is impossible, in places, to drive stakes far enough down to hold them against the heavy storms. PM

Live stock on farm

Sept.6:— Horses:— 6 horses. One three year old colt, one yearling colt.

Cattle:— Eleven milking cows. Three two-year old, two yearlings, four calves, and one bull.

Sheep:— Four sheep. The number will be increased by the arrival of the Zulu sheep which numbered twenty-three when 246 I saw them in Halifax.

Pigs:— Three pigs.

Poultry:— Forty hens and ninety chickens. PM

DEPARTMENT OF BUILDINGS & ?HA?NES .

The Saw-mill .

Sept.6 :— ?e started sawing operations about May 1, after having given the old mill a thorough overhauling, and making several changes with a view of increasing the cutting capacity.

The results have been very disappointing, for although the daily cut of lumber and shingles has been better than before, there is still not enough profit in running to make it worth while.

Two causes would seem to be responsible for this state of affairs. Judging from our experience this Spring, a mistake has been made in designing the mill by placing the heavy rotary lumber saw on the top floor, with the light shingle saw on the bottom. The reverse of this would be the logical arrangement; as now all other operations have to be suspended, while the logs are being pulled up to the second floor, it taking all the power of the engine for this, which causes a loss of time.

The second and greatest cause is the very poor location of the mill in an exposed place where all the logs have 247 to be hauled, first on to the beach, and then to the mill for s??ing, becoming in the process covered with sand and dirt which is ruinous on a ?aw.

Instead of trying to remedy either of these defects I would suggest selling the whole thing, and placing the proceeds towards buying a new portable mill, which could be set up in the bay near the entrance of the Harbor, about where Malcolm McFarlane now has a small wharf.

This would be a perfect spot, as the logs could be held in the bay by stretching a across the mouth, and then taken directly from the water to the , thus saving most of the handling, and having logs clean for sawing.

The season's work is about as follows:— 12500 feet of lumber at \$4.00 per thousand feet equals \$50.00. 3100 feet of this was logged on Beinn Bhreagh. By Mr. Davidson 1200 feet, and by Mr. Manchester 1900 feet. The remainder came from the surrounding country, where reports say there is a good supply just waiting for a reliable mill.

The cut of shingles is 122,000 at 87.5 cents per thousand \$106.75. Fence palings to the value of \$8.00. Birch blocks for C.A.C. Company \$2.00. Season's earning in all \$106.75.

??nning expenses during time of operation \$147.00.

A good mill would cut at least twice the shingles, and four times the lumber in the same time. CCS.

248

The Ugly Duckling House-beat .

Sept. 6 :— The Ugly Duckling House-beat has again been launched with the third float in pines. The said float proves to be perfectly tight around the glass window in the bottom and elsewhere, was raises the beat a good three inches in the water. We are now awaiting inspection from Dr. Bell to see what further is necessary. CCB.

The Tetrahedral Tower .

Sept. 6 :— Repairs and painting on the tetrahedral tower have been completed in a satisfactory manner. Fear broken struts have been replaced; and the whole tower has been repainted, wood work green, iron and stairs red.

CCB.

Acetylene Cas-Plant .

Sept. 6 :— Mr. E. C. Tufts of F. Campbell & Co. of St. John, M.B., arrived Saturday night (Sept.4) to rectify the trouble in the generator.

An examination Sunday showed carbide clogged in the feed-valve, a thing that Mr. Taft's tells me have never happened to a machine before during his eight years experience with acetylene lighting.

He slightly the feed-valve, and guarantees it impossible to occur again. CCB.

249

The Gauldrie .

Sept.6 :— The principal work of the Gauldrie outside of her regular trips to town, has been towing kites on the bay, and lately going up the Baddeck River in connection with the Canadian Aerodrome Company's work.

Sunday morning (Aug.20) she made a trip to Iona to meet Mr. Manchester who come from Halifax on the night train

An extra trip to Baddeck often has to be made, while she does considerable pleasure running.

Capt. McDonald tell me that since the first of Sept. he has carried 110 passengers.

The Gauldrie has also been taking part in the motor boat races during the summer of which accounts have already appeared in the Recorder. CCB.

250

BEINN BHREAGH NURSERY

Damage to fruit

Sept. 6:— The gale on Wednesday evening (Sept. 1) was a disastrous one to fruit of all kinds on BB Nursery, apples and plums suffering severely. 32 lbs. of apples were picked up off the ground after the storm, besides a quantity of plums and some limbs were broken off the plum trees. JGD

Cats

Sept.6:— Cats are too numerous on Beinn Bhreagh, and we have within the past three months done away with twelve.

Early in the summer we had quite a loss in young ducks. They were disappearing every night, and no fragment left around. I finally saw a culprit doing his work, but they deprived us of 28 young ducklings by this time, and we then commenced a wholesale slaughter.

The rifle used was a real sportsman's rifle. It would always missfire if the cat was in a sitting position, showing the sportsman's spirit only to shoot on the run, or on the wing. I have no doubt but those cats which stay in the woods all winter devour many partridges and other birds. JCD

General work of RB Nursery

Sept.6:— The work done at ?? Nursery for the week ending Sept.4 has been of a general character, such as digging and hauling of gravel for repairing the washouts on roads, 251 weeding of lawn, flower beds, and vegetables; moving and raking of lawns and sheep pasture in front of ?? fall; cleaning away manure from coach stable department; cleaning out of drain above sheep sheds; picking of vegetables and fruit; and many other odds do too, numerous to mention. JCD

Multi-nippled sheep

Sept.6: — On Sept.1 all the sheep were collected and weighed, and report of weights sent to Dr. Bell.

I commenced feeding area and lambs extra feed of oats and rolled oilcake mixed, also giving same mixture of extra food to nine young ram lambs. The five older t??s I am not giving extra food to yet, but have put them on good pasture above the high level road. This pasture extends to the top of the mountain. JCD

Look out for R?? 17A

Sept.6:— I wish to take the opportunity through the columns of the Recorder to warn all trespassers who go through the above named enclosure to have their eyes behind, as well as in front when they sight sheep in this enclosure (unless they are trained boxers), as 17A has already taken his diploma in the art of boxing. JCD

252

Weights of multi-nippled sheep 1909, Sept.1

Ewes

1605 Bf 6n s 64 lbs

1606 wf 6n t? 72

1706 Bf 6n s 79

1734 wf 7n s 85

17B wf 6n tw 62

1705 wf 6n tw 84

17A wf 6n tw 82

1901 wf 6n s 76

1913 Bf 6n tw 53

1916 Bf 6n tw 44

1922 Bf 6n tw 30

1932 wf 6n s 43

1934 wf 6n s 36

19? wf 7n s 52

19? wf 6n s 61

17A wm 6n tw 179 lbs

1814 wm 6n s 121

1821 wm 6 tw 136

1824 Bm 7n s 123

1836 wm 6n s 127

1903 wm 6n s 60

1912 wm 6n tw 60

1917 wm 6n ts 54

1921 wm 6n s 42

1928 wm 6n s 36

1929 wm 6n tw 53

1933 wm 7n s 36

19A wm 6n s 50

19D wm 6n s 50

JGD

253

Gertrude Grosvenor and some Japanese lillies in the flower garden at the point. Photo by Gilbert H. Grosvenor.

Gertrude Grosvenor among the flowers at the Point. Photo by Gilbert H. Grosvenor.

254

BEINN BHREAGH LABORATORY

Aug.31:— Made three attempts to get the half-sized model of Cygnet II into the air, but was unsuccessful in each attempt. Wind was from NW and not very steady. Amenometer readings taken after last attempt shored a wind velocity or 19.70 km per hour. WFB

New kite pole

Sept.1:— Put up a new flag pole in the kite field to fly kites from. I found on examination that the old one was all rotten. WFB

Sept.1:— We have succeeded in obtaining to-day no less than forty sets of readings of wind velocity, altitude and pull with the model of Cygnet II on the Bay. Twenty sets in the forenoon and twenty sets in the afternoon, making a total of 640 distinct instrumental observations. Forty observations of wind velocity; 400 observations of altitude; and 400 observations of pull.

Not a thing happened to interfere with the experiments and we brought the kite back on the Get-Away arms all right. Wind readings in km per hour, pull in kg. Wind very steady from SW and not a hitch in the whole list of experiments. I enclose details of observations. WFB

255

Up-side down kite of pure tetrahedral construction. Photo by J. McNeil.

Side view of same kite, showing head and tail. Photo by J. McNeil

256

Upside-down kite of pure tetrahedral construction

Sept.4:— We made some experiments with the upside-down kite of pure tetrahedral construction on the kite field. She, did not fly very well but as Dr. Bell was in the field, I will leave it to him as to the reasons, but will just say that in my opinion she would fly pretty well if she had a head load of about three or four kilograms. The times were attached r100, c100. WFB

Model of Oionos aerodrome

Sept.7:— The three horizontal surfaces are finished and covered; and the covers are all made for the oblique frames, and some are attached. Have held this up a little bit to get some work done on the Cygnet II but will go right on with it now.

We decided that we had better put bolts through the ribs to hold the obliques on to the horizontal surfaces, instead of the small screws that we used in the preliminary assembling. I am afraid that under the strains in flying as a kite that the screws might pull out so we are going to put in a 9/16 inch bolt with nut on either end. With this arrangement we can readily take off the top or bottom portion of the structure and leave the rest intact.

I enclose photographs illustrating the progress of the work on the Oionos model (see p 257). WFB

257

Model of Oionos aerodrome:— The main supporting surface receiving its covering of nainsook. Photo by J. McNeil.

Model of Oionos aerodrome:— The three main supporting surfaces completed; and a number of the obliques. Photo by J. McNeil.

258

Cygnnet II

Sept. 7:— We have this week (Aug.29-Sept.4) put the lead leads on the Cygnnet II. We fastened them on so that they can be easily removed. All we have to do is to out three cords in each weight, and lift them off. Each weight weighs 100 lbs. (45.400 kg). One is placed over the old engine bed, and the other is front where the operator sat. The weights are so arranged that half of either can be removed, and leave the other half fastened colidly in place. WFB

Model of Cygnnet II

Sept.7:— I have already amplied. Bell with the details of more than 100 sets of observations on the flight of the half-sized model of Cygnnet II with the flying line attached 100 cm in advance of the center of the kite, which corresponds to the place on the Cygnnet II which we propose to attach the flying rope.

This afternoon (Sept.7) a change was made in the attachment of the flying line to secure a greater altitude of flight.

The flying line, a Manilla rope, was attached at +75 cm, instead of at +100 cm as in former experiments, all other thing being the same.

We made twenty sets of observations this afternoon (Sept.7) the details of which have been forwarded to Dr. Bell.

The kite fle?, of course, at a much higher angle than before, and the pull was much greater, but the kite flew very 259 steadily and we had no difficulty in getting readings, and brought the kite right back on the Get-Away arms without breaking a stick. The wind was SW at about and average velocity of 35 kilometers per hour, and very steady. WF?

KITE DATA JULY 26-SEPT ? secured with model of Cygnet II

Sept.8:— Mr. Bedwin notified me Aug.28 (p 214) that all the readings of pull taken in kilograms in the kite experiments before that date should be multiplied by two, as the observer had misread the new kilogram scale to which he was not accustomed.

I have therefore thought it well to give again the kite data secured with the model of Cygnet II July 26 (p34), and Aug.11, 13, and 14 (p 132) with the corrected kilogram pulls.

I have also taken the opportunity of translating the velocity of the wind from miles per hour to kilometers per hour so as to tally with later observations.

I give on the next pages all the kite data secured with the model of Cygnet II from July 26 to Sept.1, in which the conditions were the same and similar to those we propose to adopt in flying the Cygnet II itself. AGB

260

HOTEL OF CYGNET II JULY 26-SEPT 1.

73? winged cells. Surface 39.9 as ? oblique. Weight 27.240 kg, or 60.0 lbs. Weight of rope 4.852 kg. or 10.7 lbs. Weight of cord 1.05? kg. or 2.3 lbs. For Photo see page 83.

Conditions Observations Date Exp. WL BL Wind Full Altitude July 26 1 r100 c200 31.62 km 34.? kg 21°.1 July 26 2 r100 c200 29.76 km 26.4 kg 19°.6 July 26 3 r100 c200 30.91 km 34.6 kg 31°.3 July 26 4 r100 c200 24.79 km 31.2 kg 20°.1 July 26 5 r100 c200 26.73 km 26.8 kg 19°.7 July 26 6 r100 c200 23.98 km 26.8 kg 17°.8 July 26 7 r100 c200 32.20 km 20.4 kg 20°.5 July 26 8 r100 c200 26.89 km 29.6 kg 19°.7 July 26 9 r100 c200 25.01 km 25.? kg 17°.2 July 26 10 r100 c200 27.98 km 23.4 kg 18°.1 July 26 11 r100 c200 28.01 km 34.6 kg 16°.7 July 26 12 r100 c200 27.53 km 31.6 kg 22°.4 July 26 13 r100 c200 27.37 km 27.6 kg 19°.6 July 26 14 r100 c200 33.81 km 30.0 kg 22°.8 July 26 15 r100 c200 33.17 km 41.6 kg 26°.9 July 26 16 r100 c200 36.04 km 44.4 kg 21°.9 July 26 17 r100 c200 36.37 km 45.2 kg 22°.6 July 26 18 r100 c200 36.04 km 42.2 kg 22°.2 July 26 19 r100 c200 34.61 km 50.0 kg 26°.0 July 26 20 r100 c200 33.49 km 52.4 kg 23°.5 Aug 11 1 r100 c200 37.03 km 55.6 kg 20°.8 Aug 11 2 r100 c200 38.00 km 56.0 kg 20°.2 Aug 11 3 r100 c200 37.03 km 47.8 kg 21°.7 Aug 11 4 r100 c200 39.28 km 51.8 kg 22°.2 Aug 11 5 r100 c200 38.92 km 68.0 kg 21°.4 Aug 11 6 r100 c200 38.00 km 56.8 kg 20°.2 Aug 11 7 r100 c200 37.67 km 56.6 kg 22°.4 Aug 11 8 r100 c200 37.03 km 59.2 kg 23°.7 Aug 11 9 r100 c200 36.00 km 64.0 kg 21°.4 Aug 11 10 r100 c200 37.67 km 64.0 kg 23°.0 261 Aug 13 1 r100 c200 27.37

km 20.8 kg 12°.8 Aug 13 2 r100 c200 25.76 km 18.8 kg 11°.3 Aug 13 3 r100 c200 26.89 km 22.8
 kg 14°.3 Aug 13 4 r100 c200 29.14 km 20.6 kg 14°.9 Aug 13 5 r100 c200 23.50 km 23.2 kg 17°.9
 Aug 13 6 r100 c200 28.01 km 22.0 kg 17°.0 Aug 13 7 r100 c200 28.01 km 21.5 kg 16°.6 Aug 13
 8 r100 c200 27.03 km 22.4 kg 14°.3 Aug 13 9 r100 c200 27.37 km 21.8 kg 16°.4 Aug 13 10 r100
 c200 26.24 km 22.4 kg 17°.3 Aug 14 1 r100 c200 27.37 km 26.4 kg 18°.3 Aug 14 2 r100 c200
 28.98 km 24.8 kg 18°.5 Aug 14 3 r100 c200 28.98 km 27.6 kg 19°.6 Aug 14 4 r100 c200 30.27
 km 31.6 kg 20°.1 Aug 14 5 r100 c200 30.27 km 33.8 kg 21°.3 Aug 14 6 r100 c200 29.95 km 32.6
 kg 20°.8 Aug 14 7 r100 c200 31.?? km 33.8 kg 20°.8 Aug 14 8 r100 c200 32.00 km 32.0 kg 20°.7
 Aug 14 9 r100 c200 30.27 km 32.2 kg 19°.8 Aug 14 10 r100 c200 30.99 km 30.8 kg 20°.3 Aug
 19 1 r100 c200 29.62 km 34.2 kg 22°.8 Aug 19 2 r100 c200 30.59 km 35.8 kg 22°.8 Aug 19 3
 r100 c200 29.78 km 33.6 kg 22°.1 Aug 19 4 r100 c200 29.30 km 30.8 kg 21°.4 Aug 19 5 r100
 c200 29.9° km 29.8 kg 20°.4 Aug 19 6 r100 c200 23.66 km 31.0 kg 21°.2 Aug 19 7 r100 c200
 28.34 km 28.6 kg 19°.2 Aug 19 8 r100 c200 27.05 km 25.4 kg 18°.9 Aug 19 9 r100 c200 26.56
 km 28.8 kg 20°.2 Aug 19 10 r100 c200 28.01 km 33.8 kg 23°.2 Aug 23 1 r100 c200 25.6? km
 20.? kg 10°.4 Aug 24 1 r100 c200 28.?0 km 26.0 kg 17°.0 Aug 24 3 r100 c200 29.50 km 28.4 kg
 18°.2 Aug 24 4 r100 c200 23.40 km 30.2 kg 17°.0 Aug 24 5 r100 c200 23.40 km 25.0 kg 15°.3
 262 Sept 1 1 r100 c200 27.50 km 22.2 kg 13°.7 Sept 1 2 r100 c200 27.2? km 20.5 kg 11°.4 Sept
 1 3 r100 c200 27.25 km 23.8 kg 15°.0 Sept 1 4 r100 c200 27.35 km 21.6 kg 15°.0 Sept 1 5 r100
 c200 28.00 km 22.2 kg 13°.0 Sept 1 6 r100 c200 28.00 km 22.6 kg 15°.4 Sept 1 7 r100 c200
 27.00 km 24.8 kg 15°.4 Sept 1 8 r100 c200 2°.40 km 19.0 kg 12°.0 Sept 1 9 r100 c200 27.60 km
 23.8 kg 14°.3 Sept 1 10 r100 c200 28.00 km 25.6 kg 17°.1 Sept 1 11 r100 c200 28.20 km 22.0
 kg 13°.8 Sept 1 12 r100 c200 24.80 km 23.0 kg 12°.4 Sept 1 13 r100 c200 30.60 km 25.6 kg
 16°.4 Sept 1 14 r100 c200 28.60 km 23.8 kg 14°.4 Sept 1 15 r100 c200 25.00 km 22.3 kg 14°.8
 Sept 1 16 r100 c200 31.65 km 25.0 kg 15°.6 Sept 1 17 r100 c200 28.40 km 29.2 kg 18°.6 Sept
 1 18 r100 c200 29.00 km 27.0 kg 17°.8 Sept 1 19 r100 c200 29.40 km 27.6 kg 20°.2 Sept 1 20
 r100 c200 28.65 km 23.4 kg 16°.1 Sept 1 21 r100 c200 29.60 km 24.2 kg 17°.4 Sept 1 22 r100
 c200 32.45 km 29.0 kg 19°.3 Sept 1 23 r100 c200 29.2? km 24.0 kg 14°.9 Sept 1 24 r100 c200
 31.80 km 28.2 kg 17°.2 Sept 1 25 r100 c200 30.45 km 27.8 kg 19°.2 Sept 1 26 r100 c200 29.00
 km 26.0 kg 18°.4 Sept 1 27 r100 c200 30.25 km 29.2 kg 18°.7 Sept 1 28 r100 c200 31.00 km
 27.8 kg 18°.8 Sept 1 29 r100 c200 26.25 km 25.8 kg 18.8 Sept 1 30 r100 c200 28.65 km 27.6 kg
 18°.2 Sept 1 31 r100 c200 25.85 km 30.2 kg 18°.8 Sept 1 32 r100 c200 28.60 km 30.0 kg 19°.0
 Sept 1 33 r100 c200 29.00 km 28.6 kg 19°.0 Sept 1 34 r100 c200 29.10 km 27.8 kg 18°.7 Sept
 1 35 r100 c200 24.45 km 23.8 kg 16°.8 Sept 1 36 r100 c200 24.60 km 27.2 kg 18°.5 Sept 1 37
 r100 c200 25.50 km 23.4 kg 16°.0 Sept 1 38 r100 c200 24.80 km 25.8 kg 17°.3 Sept 1 39 r100
 c200 28.25 km 26.8 kg 18°.5 Sept 1 40 r100 c200 28.35 km 27.8 kg 17°.8 263

1909, Sept.9, LIST OF EXPERIMENTS AUG 29-SEPT 7

Aug.31 :—Model of Cygnet II. Three attempts to fly this model were made in a wind of 19.90 kilometers per hours, which was not sufficient to sustain it in the air. See Bedwin's account p.254. AGB.

Sept.1 :— Model of Cygnet II. Bedwin was successful in getting no less than 40 sets of readings to-day, see p.234. AGB.

Sept.4 :— Up-side down kite of pure tetrahedral construction, of which a photograph is shown on page 255 was tried to-day. For Bedwin's account see p.256. The kite showed a tendency to turn over in the air so as to fly with the cells right-side up, but the elevation attained by the kite before she commenced to turn was not sufficient to develop the full tendency as one end of the wing-piece struck the ground. Experiments had to be postponed until repairs are made. Kite was damaged before we could get instrumental readings. It is probable that the kite can be flown, at least by a bow-line so as to secure some instrumental observations concerning the pull and life of a kite of pure tetrahedral construction with the wing surfaces of the cells pointing downwards instead of up. At present it is obvious that the lateral stability is defective, but we have no readings from which we can calculate the lift. The pull is certainly very much greater than with a kite of similar size with the cells turned right-side up. AGB.

264

Sept.7 :— Model of Cygnet II. After having secured 105 sets of observations with this kite flown by a Manilla rope attached to the front edge of the kite structure plus 100 cm from the center of the kite, the point of attachment of the rope was to-day changed to a point plus 75 cm from the center. This brings the point of attachment one cell in from the front edge of the structure. Mr. Bedwin secured 20 sets of observations this afternoon. See p.258. AGB.

NB. With the former point of attachment (r100) the kite failed to support itself continuously in the air for a sufficient time to allow of 10 observations of altitude and pull, in winds averaging 22.40 km per hr Aug 23, Exp.2; 20.40 km per hr Aug 24 Exp.2; 21.00 km per hr Aug 24 Exp ?; and failed to rise in a wind velocity of 19.90 km per hr Aug 31.

The lowest wind velocity recorded on pp 260–262, in which the kite sustained itself for a sufficient length of time to allow of a complete set of 10 observations of altitude and pull, was 23.40 km per hr Aug 24. See p.261.

The contractions employed in the table pp 260–262 are explained in foot-note to p.5?. AGB.

265

BEINN BHREAGH ITEMS AUG 29–SEPT 7 .

Sept 1 :— The acetylene gas-plant at Beinn Bhreagh Hall has refused to work this evening, and we have been obliged to resort to the old discarded oil lamps. AGB.

Sept 1 :— Motor boat race at Baddeck. Bedwin wins. Mr. and Mrs. ?W. Baldwin and Mr. McCurdy went over to town to see the races. AGB.

Sept 2 :— Motor boat races in Baddeck last evening. The Swer? won. This makes two wins each for the Qui Vive and Swerm; and one each for the Gauldrie, Hope, and Randolph. ??S.

Sept 2 :— Mr. Douglas McCurdy was called up late last night by telephone by his sister Mrs. Frost to let him know that her baby was very ill. Mr. McCurdy borrowed a motor boat from Manchester or Byrnes and went over the bay to be of any assistance he could. He reported to me by telephone that Dr. McDonald was there, and that the baby was worse, so he stayed all night. AGB.

Sept 2 :— Mr. and Mrs. A. G. Bell, Mr. and Mrs. P. W. Baldwin, and Mr. Douglas McCurdy went over the bay this afternoon and took afternoon tea with Mr. and Mrs. George Kennan where they met Mrs. Denn, a daughter of Henry W. Longfellow, Mr. and Mrs. Ellsworth, and Mr. and Mrs. McGill. Mr. McGill is one of the Canadian Commissioners to examine into labor disputes in Canada. Mr. Ellsworth is connected with the Century Magazine. I think he is 266 Secretary of the Century Company. On account of a slight failure in hearing power Mr. Ellsworth makes use of Hutchinson's Acousticon which is essentially a telephone transmitter and receiver on a short circuit.

When the receiver is brought within three or four centimeters of the transmitter, the receiver emits a shrill whistling sound, the cause of which is obscure. I found that the sound disappeared when I held my hand between the transmitter and receiver, and re-appeared when the hand was withdrawn; so that whistling signals could be produced by the alternate inter-position and removal of the hand.

We had not of course time, at an afternoon reception to make many experiments upon the matter, nor to make any experiments carefully. I found however that the sound was stopped by the inter-position of a wooden saucer, a porcelain saucer, and by newspaper folded up so that several thicknesses of paper were interposed between the transmitter and receiver. Mr. Kennan inquired whether the enforced silence might not have been due to the fact that it was a Russian newspaper! We tried a single sheet of the paper and found that it enfeebled the sound without extinguishing it. A thin sheet of Japanned iron also enfeebled the sound, but only slightly. I had expected that a metallic

sheet would have produced a greater effect than sheets of non-metallic, non-conducting substances; but the few experiments made do not bear out the idea.

On returning to Beinn Bhreagh I repeated the experiment 267 with the telephone transmitter and receiver on our private line to Baddeck, but could not obtain any whistling sound. AGB.

Sept 2: — Acetylene plant at the Point still out of order. No light but that from kerosene lamps. I fear we shall have to call in outside assistance to remedy the trouble. AGB.

Sept 4 :— Mr. and Mrs. Bell, Mr. and Mrs. Baldwin, Mr. and Mrs. Gilbert H. Grosvenor, and Mr. and Mrs. Richelberger went over the bay this afternoon to attend an afternoon tea given by Mr. and Mrs. Magill (Susie Stairs). AGB.

Sept 6: — Visitors at Nursery:—

Aug 29:— Mrs. B.F. Blake and her son Jack, and Mrs. Smith and Miss Ida Smith of Mabou; Mrs. James Dunlop of Baddeck.

Aug 31:— Margaret C. McDonald of NE Margaree; Dan McInnis of Big Baddeck; V. MacAskill, and Mary S. McDonald of Baddeck.

Sept 3:— Dr. Metaler, Dentist of Baddeck. JGD.

Sept 6 :— V. R. MacAskill, Margaret C. McDonald, Dan McInnis and Mary S. McDonald had a pleasant moonlight drive from Baddeck to BB Nursery Aug.31. The evening was fine, cool, and well suited for the occasion. Miss Mary S. McDonald left Sept.2 with Mrs. Dr. Richardson for Norrisville, Pa. to enter a course of training for a nurse. Mr. V. MacAskill leaves Baddeck Sept 8 to again take up his studies at Dalhousie College. JGD.

268

Sept 7 :— Miss Anna Urquhart returned to Beinn Bhreagh from Spring Hill, Cumberland County, and Folly Village where she has been visiting friends and relatives for two weeks. She found her sister recovering from her illness. AGB.

Sept 7 :— Miss McIver, Miss McDonald, Miss Livingstone of Sydney, Miss Jackson and Miss Gillis of Baddeck visited Beinn Bhreagh on Wednesday afternoon (Sept 1)

AGB.

Sept 7 :— We had a series of motor boat races to close up the competition for the cup. There were three races run. The Aberdare won twice, and the Swe? once.

This makes three wins for the , thereby wining the 1909 Handicap Motor boat Trophy. WFB.

Peary Gains the Pole .

Sept 7 :— Beinn Bhreagh has been favored by a cablegram from Peary announcing his discovery of the North Pole. The cablegram, which was sent from Indian Harbor Labrador was addressed to Mr. Grosvenor in Washington, D.C. and forwarded to him here this morning. It reads as follows:—

Sept 6:— Have won out at last. The Pole is ours. With regards to yourself and Mrs. Grosvenor.

(Signed) Peary.

Mr. Gilbert H. Grosvenor is the Editor of the National Geographic Magazine, the official organ of the National Geographic Society, a Society which has given substantial aid to Peary's expedition.

269

Mr. Charles R. Cox, as correspondent of the New York Herald has interviewed Mr. Grosvenor upon the subject of Peary. He reports Mr. Grosvenor as saying:—

This is a double victory for Peary because Cook got to the North Pole by following Peary's route, and carrying out the plan which Peary had formed as a result of 20 years of Polar work. These plans Peary announced to the world on his return from his last expedition in 1909, when Peary said that another attack upon the Pole on this program would succeed. Cook was able to start before Peary, and has proved that the plan of attack originated by Peary is successful whether carried out by Peary himself or by another person. Peary has bl?sed the way to the Pole and the fact that another men used the track first is no way detracts from Peary's splendid achievements.

The distinguished Baddeck representative of the New York Herald knowing that I am an Ex-President of the National Geographic Society and still a member of its Board of Managers also interview ed me upon the discovery of the North Pole first by Dr. Cook and then by Commander Peary.

I have no idea of what I said upon the occasion but this is what he reports:—

It is wonderful to think that after so many years of diligent searching by expeditions representing different nations of the world, the Pole should finally be reached by two Americans.

To Peary belongs the credit of showing the world the way, although unfortunately he was not the first to pursue his path to the end.

Peary is expected to arrive in Sydney on Friday Sept 10.

AGB.

270

THE CONTRIBUTIONS OF XYZ .

Very Like a Whale .

Sept 7 :— Mr. Davidson can tell a pretty big fish-story when he likes (see p. 205), but he can't hold a candle to Mr. Jim McKensie in this respect.

Mr. McKensie reports that a few days ago, while standing on the rocks at the Point, a gigantic fish rose out of the water near the Point.

It was at least 20 feet long when he first saw it, and it has been growing constantly larger ever since. He says, and we believe him, that it was ?Very like a whale?

This is evidently one of the many mysterious happenings on Beinn Bhreagh demanding explanation. I venture to suggest that the whale came from the Artic Regions to announce the discovery of the Pole by Peary, and beat the wireless telegram to Grosvenor by several days. XYZ.

A New Contortionist on Beinn Bhreagh .

Sept 7 :— One evening last week our distinguished machinist at the Laboratory, having dressed himself to visit some of the Calico of Baddeck, judging from his band-box appearance, discovered, on the impulse of the moment, a new and unique way of immersing the body, somewhat similar to the method recently illustrated by the Capt. of the Gauldrie.

271

Just as Mr. was shout to enter his boat his foot caught on a rope, and he prayed again the truth of the old saying that "everything that goes up, must surely come down". At least he came down into about eight fo?t of water which did not improve his appearance. Of course he was late for his appointment and when asked for an explanation gave as an excuse the necessity of removing his "aqueous impediments " . His friends were not quite sure what this meant, but we know and that is sufficient. XYZ.

Light upon the Light on the Tower .

Sept 7 :— A prominent resident of Beinn Bhreagh, who is a regular Sharlock Holmes in ability, being dissatisfied given with the explanation of the mysterious light seen on the top of the tetrahedral tower the other night, given in the Recorder p.227, has applied his detective abilities to discover whether there were any visitors to the tower that night. He claims to have discovered the foot-prints of the ghost and says that they bear the unmistakable imprint of the eleven-hoof.

Unwilling to believe that we had had a visitor from the nother regions he suggests a more natural explanation.

There are the Angora goats, not far from the tower which have their contempt for Beinn Bhreagh fences and which are famed for their ability to climb.

The leader of the herd is a bold venturesome chief of his race with a set of magnificent horns measuring from 272 6 to 8 feet in length, and he has been seen upon more than one occasion looking out for new pastures for his flock. The suggestion of our Sherlock Holmes is as follows:—

"It being until the past two weeks a very dry season the pasture in their enclosure had been getting dry and distasteful to them as the Commodore was frequently seen taking observations, Nature has gifted these animals to be surefooted, and they are famed as being great climbers.

On this particular night the Commodore ascended the long stairs to the top of the tower, carrying with him his field glasses to look for pastures green.

When asked how this explained the light that was seen on the tower he replied:—

He took fire flies on his horns to use as a searchlight.

Perhaps this explanation is as good as the one formerly given. XYZ.

Sept.13, 1909 STUDY OF KITE DATA secured July 26–Sept.1

Sept. 13:— The following table gives a summary of the data secured with the model of Cygnet II, July 26–Sept.1, see pages 260–262. The observations are arranged in the order of altitude; and the averages are only noted in cases where ten or more observations had been secured.

Summary Averages Grouped Altitudes			No of obs	Wind km	Pull kg	Altitude	Wind km	Pull kg
Altitude	10°–11°	3	78.61°	9.9	33.1	12°–13°	6	158.57
	12°–13°	6	158.57	129.2	78.3	14°–15°	13	358.18
	14°–15°	13	358.18	302.5	192.6	16°–17°	22	615.31
	16°–17°	22	615.31	548.4	373.7	18°–19°	24	686.86
	18°–19°	24	686.86	669.9	454.8	20°–21°	22	712.37
	20°–21°	22	712.37	853.6	458.0	22°–23°	13	437.21
	22°–23°	13	437.21	569.6	295.4	24°–25°	1	34.61
	24°–25°	1	34.61	50.0	25.0	26°–27°	1	33.17
	26°–27°	1	33.17	41.6	26.0	Total	105	3114.89
	Total	105	3114.89	3234.7	1937.8			29.66
								30.80
								18.45

The following table shows the calculated efficiency of the Cygnet II model from the averages of the experiments noted above.

Alt	Sin.	Cos.	Pull kg	Vert kg	Horiz kg	Lift kg	Drift kg	Efficiency
15°	.259	.966	23.26	6	22	39	22	1.77
17°	.292	.956	24.92	7	24	40	24	1.67
19°	.326	.946	27.91	9	26	42	26	1.61
21°	.358	.934	39.25	14	36	47	36	1.30
23°	.391	.920	43.61	17	40°	?0	40	1.25
18°	.309	.951	30.50	9	29	42	29	1.45

AGB

SOME RANDOM THOUGHTS ABOUT PHONE CONTROLS : by Wm.F Bedwin

Sept.11:— First and foremost I think that the front control should be at the rear; but necessarily it must be in front for several reasons. Most important of which is, I think the necessity of being able to see it, so as to know to a certainty exactly what one is doing with it, its action being so sensitive. But would it be so sensitive if it was at the rear?

Well, put it in front at any rate, and what do we want? We want a surface there that will have as little drift as possible, and still be capable of steering the head of the machine either u or down.

I think that a surface having a convex surface both on the upper and lower side of it, would be a much more safe, and much less dangerously sensitive control than the one with a concave curved surface on the under side only.

While it may be good policy to have the surfaces with a lifting curve, I do not believe it. As far as I can see, the front control is nothing more nor less than a vertical rudder placed the other way (horizontally); and who would think of having one side of a vertical rudder concave and the other side convex ? !

The only advantage that I can see in using a convex double control over a flat surface would be in construction. The one having convex surfaces would be much more rigid than 275 the flat surface.

Given the same drift element, there is one thing that might be brought forward in favor of the concave unde? surface control, and that is the extra lift it would have in giving the machine a shoot into the air. But do we want to "shoot a machine into the air"? Do we not rather want to "let her up" as it were, by slowly raising the front control from the negative angle at which it is held while running along the ground, to a flat or slightly positive angle?

In my opinion if a machine won't rise without having to shoot her up with the control, she won't fly satisfactorily after she is shot up if indeed she gets up at all.

All this, of course, provided the place of starting is reasonably smooth, and the friction of wheels is not more than the surplus power of the engine could overcome.

I think it quite possible to build a single-surface front-control that would be lighter and better than the double-surface box-structures in use on most machines to-day.

OBLIQUE LATERAL RUDDERS : by Wm.P. Bedwin

Sept.11:— Would suggest for discussion the matter of a vertical rudder for the Oionos drome.

I think it possible to put a surface or rudder, hinged at the front edge of the lower oblique surface, at either side of the wing-piece, and normally have them folded back on the oblique. If you want to steer to port, pull out the one on 276 the port side, and thus introduce a greater drift there. This should turn the machine's head in the direction desired, and incidentally give the same wing a little more lifting surface. This it needs anyway, it being the part travelling the lesser distance in making a turn.

Perhaps these rudders may be arranged to take the place of wing tips as well. I can't quite see how at present. The matter of arranging the mode of operating these rudders may necessitate too much

complication at the operator's seat. I only offer it as a suggestion in an endeavor to get something new, and possibly better than the ordinary means used.

WFB

PAPER WINGS FOR AERODROMES: by K. Ingraham

Sept.11: — The enclosed sketch will give an idea of sections for the supporting surfaces of aerodromes made from wood and paper.

This construction seems to me very cheap. One feature is that the section, when finished, is ready for the air, no cloth covering being necessary. By applying a coat of varnish it can be made water and wind proof.

I also believe that a machine made in this way can be constructed quicker than the aerodrome of to-day, which means a good commercial machine, easy to knock down and get assembled again. KI

277

Sketch illustrating Ingraham's idea of paper wings for aerodromes (see p 276). Photo by J. McNeil.

278

SHEEP STATISTICS FOR TWENTY YEARS : by A.G. Bell

Sept.14 :— The first lambs born on Beinn Bhreagh of which records have been preserved, appeared in the Spring of 1890.

In 1893 sixty-seven lambs were born; and in the autumn of that year the flock of ewes was cut down severely. All ewes not having four functional mammae yielding milk were rejected.

The result was that in 1894 only seventeen lambs were born; but, in subsequent years, as the flock again increased in numbers, it was found that very few lambs appeared having less than four nipples. The vast majority of the lambs born had four nipples apiece, while quite a number appeared having five or six nipples.

Since 1894 the selection has been chiefly by males. Ewes having four or more nipples were retained but after the appearance of six-nippled males were kept excepting in exceptional cases.

A study of the statistics of the flock during the last twenty years has satisfied me that, in order to increase and perpetuate the desired peculiarities of the flock, the multiplication of nipples and the production of twins, it is more important to make our selection by females than by males. The peculiarities themselves are female characteristics, and seem to be more strongly inherited in the female line than the male.

This year (1909) forms the conclusion of twenty years 279 of experimental sheep-breeding on Beinn Bhreagh, and we are now making a new departure.

While we shall continue the plan adopted for some years past of retaining only males having six nipples or more, we shall now follow the same plan with the females. This summer we have rejected all ewes having less than six nipples. This reduces our flock of ewes to only fifteen.

From past experience we anticipate that the vast majority of the lambs born will be found to possess six nipples or more. As the flock increases we will continue the selection of females; and reject not only females having less than six nipples, but also female lambs in which the super-numerary mammae are not well arranged, or are not functional. At present we have too few ewes of the kind desired to permit of this selection and are obliged to keep all having six nipples or more quite irrespectively of the arrangement or character of the nipples.

Our new departure makes this a fitting time to take a backward glance at the records of the past to see where we stand; and I therefore present a few statistical tables relating to the lambs born on Beinn Bhreagh during the last twenty years (1890–1909), showing the number born each year, and the number born arranged in five-year, and ten-year periods.

Table I relates to the color of the lambs born, whether white or black.

Table II relates to their sex, whether male or female.

Table III Fertility: Whether the lambs were single, twin or triplet.

280

Table IV Mammae:—Showing the number of nipples possessed by the lambs, whether 2n, 3n, 4n, 5n, 6n, 7n or 8n.

Table V Mammae continued:—Showing the percentage of lambs having 2n, 3n, 4n, 5n, 6n, 7n, or 8n.

Table VI. Mammae continued:—Showing the percentage having 2n or more, 3n or more, etc.

These tables were prepared by me during my recent trip to England, and were forwarded to Mr. Davidson. I desire now to place them upon record here. AGB

281

SHEEP STATISTICS 1890-1909

Table I Color

Year of birth	Total lambs	Number	Percentage	White	Black	White	Black
1890	72	89	3	95.8	4.2		
1891	78	75	3	96.2	3.8		
1892	71	70	1	98.8	1.4		
1893	67	66	1	98.5	1.5		
1894	17	16	1	94.1	5.9		
1895	26	19	7	73.1	26.9		
1896	27	18	9	??	33.3		
1897	34	22	12	64.7	35.3		
1898	37	22	15	59.5	40.5		
1899	43	30	13	69.8	30.2		
1900	45	35	10	77.8	22.2		
1901	32	28	4	87.5	12.5		
1902	52	49	3	54.2	5.8		
1903	54	44	10	81.5	18.5		
1904	62	51	11	62.3	17.7		
1905	31	28	3	90.3	9.7		
1906	36	30	?	78.9	21.1		
1907	36	26	10	72.2	27.8		
1908	37	31	6	63.8	16.2		
1909	35	30	5	85.7	14.3		
1890-4	305	296	9	97.0	3.0		
1895-9	167	111	56	66.5	33.?		
1900-4	245	207	36	74.5	25.5		
1905-9	177	145	32	81.9	18.1		
1890-9	472	407	63	86.2	13.8		
1900-9	422	352	70	83.4	16.6		
Total	894	759	135	84.9	15.1		

Table II Sex.

Year of birth	Total Lambs	Number	Percentage	Male	Female	Male	Female
1890	72	44	28	61.1	38.9		
1891	78	39	39	50.0	50.0		
1892	71	30	41	42.3	57.7		
1893	67	35	32	52.2	47.8		
1894	17	9	8	62.9	47.1		
1895	26	12	14	46.2	53.8		
1896	27	12	15	44.4	55.6		
1897	34	21	13	61.8	38.2		
1898	37	23	14	62.2	37.8		
1899	43	21	22	48.8	51.2		
1900	45	14	31	31.1	68.9		
1901	32	14	18	43.8	56.2		
1902	52	30	22	57.7	42.3		
1903	54	32	22	59.3	40.7		
1904	62	33	29	53.2	46.8		
1905	31	19	12	61.3	38.7		
1906	38	21	17	35.3	44.7		
1907	36	18	18	50.0	50.0		
1908	37	13	24	35.1	64.9		
1909	35	19	16	54.3	45.7		
1890-4	305	137	148	51.5	48.5		
1895-9	167	89	78	53.3	46.7		
1900-4	243	123	122	50.2	49.8		
1903-9	177	90	87	50.8	49.2		
1890-9	472	246	226	52.1	47.9		
1900-9	422	213	209	50.5	49.5		
Total	894	459	435	51.3	48.7		

Table III Fertility

Year of birth	Total lambs	Number	Percentage	Single	Twin	Triplet	Single	Twin	Triplet
1890	72	36	36	50.0	50.0				
1891	78	43	32	3	53.1	41.0	3.9		
1892	71	59	12	83.1	16.9				
1893	67	63	?	94.0	6.0				
1894	17	15	2	87.2	11.8				
1895	26	24	2	92.3	7.7				
1896	27	17	10	63.0	37.0				
1897	34	22	12	64.7	35.3				
1898	37	21	16	56.8	43.2				
1899	43	25	18	58.1	41.9				
1900	45	29	16	64.4	35.6				
1901	32	28	4	87.5	12.5				
1902	52	42	10	80.8	19.2				
1903	54	48	6	86.9	11.1				
1904	62	56	6	90.3	9.7				
1905	31	?	5	6	80.6				
1906	38	27	8	3	71.1	21.0	7.9		
1907	36	30	6	83.3	16.7				
1908	37	25	12	67.6	32.4				
1909	35	21	14	60.0	40.0				
1890-4	305	216	86	3	70.8	28.2	1.0		
1895-9	167	109	58	65.3	34.7				
1900-4	243	203	42	82.9	17.1				
1905-9	177	128	46	3	72.3	26.0	1.7		
1890-9	472	326	144	3	68.9	30.5	0.6		
1900-9	422	331	88	3	78.4	20.9	0.7		
Total	894	656	232	6	73.4	25.9	0.7		

Table IV Mammae

Year of birth	Total lambs	Number	2n	3n	4n	5n	6n	7n	8n	1890	72	60	4	?	1891	78	40	9	29	1892	71										
29	4	37	1	1893	67	15	8	44	1894	17	1	2	14	1895	26	2	23	1	1896	27	23	3	1	1897	34	1	27	3	3	1898	
37	26	5	6	1899	43	1	26	5	11	1900	45	1	1	28	13	2	1901	32	26	3	3	1902	?2	2	39	6	5	1903	54	36	
12	6	1904	62	16	2	30	11	3	1905	31	14	9	8	1906	38	4	17	8	8	1	1907	36	1	18	7	8	2	1908	37	1	20
7	8	1	1909	35	1	3	9	7	13	1	1	1890-4	305	145	27	132	1	1895-9	167	4	125	17	21	1900-4	245	17					
5	169	45	19	1905-9	177	2	8	78	38	45	4	2	1890-9	472	145	31	257	18	21	1900-9	422	19	13	237							
83	?4	4	2	Total	894	164	44	494	101	83	4	2	285																		

Table V Mammae (continued)

Year of birth	Total lambs	Percentage	2n	3n	4n	5n	6n	7n	8n	1890	100.0	83.3	5.6	11.1	1891	100.0	51.3	11.5	37.2	1892	100.0	40.9	5.6	52.1	1.4	1893	100.0	22.4	11.9	65.7	1894	100.0	5.9	11.8	82.3	1895	100.0	7.7	88.5	3.8	1896	100.0	85.2	11.1	3.7	1897	100.0	3.0	79.4	8.8	8.8	1898	100.0	70.3	13.5	16.2	1899	100.0	2.3	60.5	11.6	23.6	1900	100.0	2.2	2.2	62.2	28.9	4.5	1901	100.0	81.2	9.4	9.4	1902	100.0	3.9	75.0	11.5	9.6	1903	100.0	66.7	22.2	11.1	1904	100.0	25.8	3.2	48.4	17.8	4.8	1905	100.0	45.2	29.0	25.8	1906	100.0	10.5	44.7	21.1	21.1	2.6	1907	100.0	2.8	50.0	19.4	22.2	5.6	1908	100.0	2.7	54.1	18.9	21.6	2.7	1909	100.0	2.9	8.6	25.7	20.0	37.1	2.9	2.8	1890–4	100.0	47.5	8.9	43.3	0.3	1895–9	100.0	2.4	74.8	10.2	12.6	1900–4	100.0	6.9	2.0	64.9	18.4	7.6	1905–9	100.0	1.1	4.5	44.1	21.5	25.4	2.3	1.1	1890–9	100.0	30.7	6.6	54.5	3.8	4.4	1900–9	100.0	4.5	3.1	56.1	19.7	15.2	0.9	0.5	Total	100.0	18.4	4.9	35.3	11.3	9.6	0.4	0.2	286
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Table VI Mammae (continued)

Percentage	Year of birth	2n or more	3n or more	4n or more	5n or more	6n or more	7n or more	8n or more								
100.0	1890	15.7	11.1	100.0	48.7	37.2	100.0	59.1	53.5	1.4	100.0	77.6				
66.7	1894	100.0	94.1	82.3	100.0	100.0	92.3	3.8	100.0	100.0	100.0	14.6	3.7	1897		
100.0	100.0	97.0	17.6	8.6	100.0	100.0	100.0	29.7	16.2	100.0	100.0	97.7	37.2	25.6		
100.0	1900	100.0	97.5	95.6	33.4	4.5	100.0	100.0	100.0	18.8	9.6	100.0	100.0	96.1	21.1	9.6
100.0	1903	100.0	100.0	100.0	33.3	11.1	100.0	100.0	74.2	71.0	22.6	4.6	100.0	100.0	100.0	74.8
25.8	1906	100.0	100.0	89.5	44.8	23.7	2.6	2.6	100.0	100.0	97.2	47.2	27.6	5.6	100.0	97.3
97.3	1909	100.0	97.1	68.5	62.8	42.8	5.7	2.8	287							

1909, Sept.15 KITE DATA SEPT 7-13 . Secured with model of Cygnet II.

Conditions	Observations	Date	Exp.	FL	EL	Wind	Pull	Altitude	Sept 7	1	r75	c200	37.70	km	62.4	kg	
31°.6	Sept 7	2	r75	c200	37.40	km	59.4	kg	3°.1	Sept 7	3	r75	c200	36.00	km	61.6	kg
31°.7	Sept 7	4	r75	c200	36.00	km	62.4	kg	51°.6	Sept 7	5	r75	c200	36.40	km	58.2	kg
30°.4	Sept 7	6	r75	c200	35.00	km	55.2	kg	30&.5	Sept 7	7	r75	c200	34.00	km	51.4	kg
31°.3	Sept 7	8	r75	c200	35.00	km	57.2	kg	30°.1	Sept 7	9	r75	c200	35.00	km	58.6	kg
30°.4	Sept 7	10	r75	c200	33.20	km	53.8	kg									

29°.8 Sept 7 11 r75 c200 33.50 km 52.6 kg 30°.2 Sept 7 12 r75 c200 34.00 km 55.8 kg 29°.3
Sept 7 13 r75 c200 33.60 km 53.2 kg 29°.8 Sept 7 14 r75 c200 32.30 km 53.2 kg 30°.7 Sept 7 15
r75 c200 34.00 km 53.6 kg 30°.3 Sept 7 16 r75 c200 34.00 km 54.0 kg 30°.3 Sept 7 17 r75 c200
33.40 km 57.8 kg 31°.7 Sept 7 18 r75 c200 35.00 km 53.2 kg 30°.6 Sept 7 19 r75 c200 34.00
km 50.2 kg 30°.2 Sept 7 20 r75 c200 34.50 km 53.0 kg 29°.9 Sept 13 1 r50 c200 22.25 km 59.4
kg 40°.1 Sept 13 2 r50 c200 22.50 km 59.0 kg 39°.3 Sept 13 3 r50 c200 23.80 km 57.6 kg 39°.1
Sept 13 4 r50 c200 26.00 km 61.2 kg 39°.7 Sept 13 5 r50 c200 23.25 km 66.4 kg 39°.4 Sept 13 6
r50 c200 23.90 km 67.0 kg 40°.2 Sept 13 7 r50 c200 22.00 km 70.0 kg 40°.7 Sept 13 8 r50 c200
22.25 km 63.6 kg 41°.3 Sept 13 9 r50 c200 23.30 km 70.2 kg 40°.9 Sept 13 10 r50 c200 22.60
km 68.6 kg 40°.8 Sept 13 11 r50 c200 20.40 km 54.5 kg 40°.7 Sept 13 12 r50 c200 21.90 km
69.6 kg 41°.0 Sept 13 13 r50 c200 22.80 km 65.6 kg 40°.1 Sept 13 14 r50 c200 24.05 km 64.6
kg 40°.9 Sept 13 15 r50 c200 25.50 km 68.6 kg 40°.4 Sept 13 16 r50 c200 22.40 km 68.4 kg
39°.6 Sept 13 17 r50 c200 23.00 km 66.6 kg 41°.1 Sept 13 18 r50 c200 22.30 km 62.0 kg 39°.8
Sept 13 19 r50 c200 22.50 km 64.8 kg 39°.5 Sept 13 20 r50 c200 24.80 km 66.6 kg 39°.7 288

Sept.16, 1909 BEINN BHREAGH NURSERY

More Cats

Sept. 13:— Since last issue of Recorder, seven more cats have been done away with which includes the culprit who killed the young ducklings. Many attempts throughout the summer have been made to end its career. JCD

Angera Goats

Sept. 13:— About five years ago a flock of Angera Goats was purchased by Mrs. Bell early in the summer months for Beinn Bhreagh Farm Department and they remained not on the farm but on the estate until late in the fall of the year. By this time the farm Department had had all the experience they necessarily desired in knowing they could not make fences to keep those animals in an enclosure.

They were then transferred to B.S. Nursery and have existed here since under somewhat similar conditions as on the farm, as fencing for Goats is a somewhat difficult proposition. Not that they jump the fences but they have a habit of getting through very small openings underneath, or in fact if a mesh of the netting wire gets broken they soon find it large enough to get through.

The flock then consisted of five males and three females and they have increased very slowly since. Today the flock consists of six males and five females (total eleven) although this does not indicate they are not productive as the following 289 table of accidents, etc. shows.

2 males drowned by falling into wells.

1 female lamb died from effects of tree falling on her during a gale.

1 male had his back broken by pulling a bale of hay, which was improperly stored, on to himself.

2 males were found hanged between thicket of trees at different times.

2 females died unknown disease.

3 male lambs died when born, from cold and exposure.

1 doe dropped her lamb or lambs catside and was never seen, but the doe returned.

It will be seen by above table that the majority of the offspring have been males and we still have a majority of males.

These goats, although they have their bad qualifications, undoubtedly have their good points, which anyone can readily see who knows the pastures they have been in since coming on Beinn Bhreagh Nursery Department. The undergrowth was then so thick it was almost impenetrable; and today one can get through out any part of the thickets.

True, they prefer the hardwood in the spring and summer months, but during the winter months the fir has the preference. They not only eat the foliage but they bark the tress and one has only to look around the building where they have their winter quarters, and compare it today to what it was four years ago.

It has been written about Angera Goats stripping down trees fifteen and twenty feet high. This may appear to some as being exaggerated but to those who have seen them at their work it is in no instance exaggerated even by adding five or ten feet more. Take a thicket of trees where they grow long 290 and slim on account of not getting sufficient light and air around them, the goat will stand up on his hind legs and get the full weight of the body on the tree bending it down. The others immediately flock around rising to the occasion of getting it lower, and one by one their weight is on the tree until finally the top of the tree is on the ground; and held fast until it is completely devastated of the foliage, and the bark also if to their taste. Nothing remains for the tree then when

stripped of its bark but to die. Anyone having a large area of thick undergrowth which they wanted cleared up I would certainly recommend a large flock of Angera Goats.

The young kids when born are very delicate, much more so than lambs. This is why it is recommended that the kids should not be born until the foliage begins to come on the trees in the spring, the weather being then warmer. When about two weeks old they pick up very quickly and are then much smarter than a lamb at the same age, although they do not mature so rapidly as a lamb.

During the winter months, if the weather is fine, they prefer to browse, rather than feed inside, but if there is any depth of soft snow they do not care to leave their house. If the snow gets a nice hard surface it is then they do their good work in a thicket of aspen trees, and if a tree chances to be cut or broken down they immediately have it barked from top to bottom.

These goats are also very good weather prophets. If at any time during the summer or fall season they are seen coming down the mountain to their house during the day, it is a sure sign a rain storm is near at hand. A shower of snow does not affect them, but they do not like the rain.

The wool, or mohair is also valuable, but we have as yet been unable to make a market for same in Canada although I corresponded with several manufacturers two or three years ago. They all replied they had not the machinery to manufacture it. I understand this season the Hawson mills are going into mohair manufacture.

The meat has not yet been used on Beinn Bhreagh although in the western parts of the United States it is sent to the market as "Lamb" and considered to be as good as the finest lamb but has to be house-fed for a month or more to take the wild flavor off the meat. JCD

General work Sept.5-11

Sept.13:— Work on Beinn Bhreagh Nursery for week ending Sept. 11 has been digging and hauling of gravel for road leading from High level road to North Shore Between points of private roads; weeding vegetables and flowers; tying up of flowers and vines; mowing lawns; and general cleaning of driveways. JCD

Visitors at BB Nursery

Sept.13:— The following visitors have registered at the Nursery during the last week:—

Sept.9: — Miss M. W. Schenck of Brooklyn, N. Y.; Miss S. Stewart of ?uttery, N.J.; Annie C. Anderson, and Alexander Anderson of Baddeck.

JCD

292

SHEEP DISTRIBUTION

Sept.16 :— Last year a number of our multi-nippled sheep were presented to Mr. Angus McInnes of Big Baddeck, the former to Manager of Beinn Bhreagh Estate; and this year we gave away, to farmers who will co-operate with us in our sheep-breeding experiments, all the remaining four-nippled and five-nippled ?wes upon the place. In order to preserve some record concerning these sheep I beg to enclose a list of the sheep with the names of their present owners.

Sheep Present Owner 1019 Bf 8n s 6 Angus McInnes, Big Baddeck 1023 wf 8n s 24 Angus McInnes, Big Baddeck 1101 wf 4n s 15 Angus McInnes, Big Baddeck 1228 wf 4n s 56 Angus McInnes, Big Baddeck 1333 Bf 6n s 237 Angus McInnes, Big Baddeck 1339 wf 4n s 247 Angus McInnes, Big Baddeck 1432 wf 4n s 12 Angus McInnes, Big Baddeck 1620 wf 4n s D 28 Angus McInnes, Big Baddeck 1622 wf 5n s 36 Angus McInnes, Big Baddeck 1703 wf 4n s D 26 P.A. McRae, Big Baddeck 1709 Bf 4n s D 5 William McKenzie, Big Baddeck 1714 Bf 5n s 3 Angus McInnes, Big Baddeck 1716 wf 5n s D 38 Percy Manchester, Beinn Bhrea?h 1720 Bf 4n s 2 Angus McInnes, Big Baddeck 1806 wf 4n tw D 18 A.D. McRae, Bentick Farm 1808 wf 4n s D 23 Angus McInnes, Big Baddeck 1809 wf 4n s D 1 A.D. McRae, Bentick Farm 1815 wf 4n tw D 12 Angus McInnes, Big Baddeck 1816 wf 4n tw D 13 F.A. McRae, Big Baddeck 1817 Bf 4n s D 3 William McKenzie, Big Baddeck 1819 wf 4n tw D 14 A.Y. McDonald, Inl?t 1820 wf 5n tw D 15 Percy Manchester, Beinn Bhreagh 1822 wf 4n tw D 25 A.Y. McDonald, Islet 1823 wf 4n s D 17 A.D. McRae, Bentick Farm 1825 wf 5n s D 4 Percy Manchester, Beinn Bhreagh 1826 wf 4n s D 8 F.A. McRae, Big Baddeck 1827 Bf 4n s 6 William Crowdis, Inlet 1829 wf 4n s D 27 F.A. McRae, Big Baddeck 1831 wf 5n s 35 Percy Manchester, Beinn Bhreagh 1832 Bf 4n s 12 William Crowdis, Inlet 1902 wf 4n s D A.Y. McDonald, Inlet 1907 wf 4n tw D John Morrison, Baddeck Bay 1911 wf 5n s W.J. McDonald, Baddeck Bay 1918 wf 4n s D A.D. McRae, Bentick Farm 1923 Bf 3n tw Angus McInnes, Big Baddeck 1926 wf 5n s D W.J. McDonald, Baddeck Bay 1927 wf 4n s D A.D. McRae, Bentick Farm 1935 wf 5n s D John Morrison, Baddeck Bay 1607 wf 6n tw 35 Dr. McDonald, Baddeck 293

Cut flowers at Beinn Bhreagh Hall. Photo by Mrs. Bell.

Cut flowers at Beinn Bhreagh Hall. Photo by Mrs. Bell.

294

Cut flowers at Beinn Bhreagh Hall. Photo by Mrs. Bell.

Cut flowers at Beinn Bhreagh Hall. Photo by Mrs. Bell.

295

DEPARTMENT OF BUILDINGS & WHARVES

Crescent Grove Boat-house

Sept. 13:— How foundation posts have been put under Crescent Grove boat-house, as the severe storms of late showed the old ones to be in a rather shaky condition. We have also put a new gate and posts upon the way to the boat-house from the main road.

CCB

Superintendent's Office

Sept. 13:— The office roof has been re-shingled and a new verandah roof has been built forming a continuous line with the main roof, thus giving the building a somewhat similar appearance to the cottage near by. This was Mrs. Bell's idea, and makes a great improvement in the appearance of the office.

CCB

Glass-bottomed House-boat

Sept. 13:— We will put the finishing touches on the Ugly Duckling house-boat at once and get her ready to be towed to Big Baddeck for Dr. Bell's use in camping out while the Canadian Aerodrome Company are carrying on operations there.

CCB

Baddeck No. II leaves BB

Sept. 13: — The Gauldrie has gone up Baddeck River today towing Baddeck No. II on board the Get-Away.

CCB

296

Bungalow at Crescent Grove

Sept. 13:— I expect to have plans for the Bungalow near Crescent Grove boat-house completed today. If satisfactory, will begin operation? at once. CCB

Beinn Bhreagh Lodge

Sept. 13: — Have had a carpenter at the Lodge for a few days replacing broken glass, and doing other repair work there. CCB

McKenzie returns with a wife

Sept. 13:— Mr. Angus McKenzie, who since leaving here two weeks ago has been married, came back to work this morning. CCB

New House-boat goes to Baddeck River

Sept. 13:— The Gauldrie towed the Ugly Duckling house-boat to Baddeck River today. The top had to be taken off to go under the bridge. It was then towed up the river to the flying ground of the Aerodrome Company at the Bentick Farm and anchored there awaiting Dr. Bell's convenience. CCB

297

BEINN BHREAGH LABORATORY

Malcolm McFarlane

Sept. 8 :— Word has been received from Malcolm to the effect that he is improving rapidly now, and expects to be back to work shortly.

WFB

Repairs to Gauldrie

Sept. 10 :— The Gauldrie is at the Laboratory for some repairs. The push rod of the intake valve on No. 4 cylinder is broken off. We are making a new part for her. WFB

Oionos model

Sept. 11 :— The wing piece of the model of the Oionos machine is completed today; and we will start in, the first part of the week to put on the tail, etc. I forward two photographs of the wing piece showing its present condition. (see p. 298).

WFB

298

Wing piece of model of Oionos aerodrome which is to be flown as a kite. Side view. Photo by J. McNeil.

Wing piece of Oionos model front view. Photo by J. McNeil.

299

CANADIAN AERODROME CO.

The Aero Shed at Big Baddeck .

Sept 5 :— A bit of news concerning the building of the new aerodrome shed on one of the best testing grounds in Canada for aerodromes.

We commenced on Monday Aug. 30, having seven men; namely, K. Ingraham, Mardock Ferguson, John McLean, Malcolm Doherty, A.D. MacRae (B?ntic), A.D. MacRae, W.C. MacRe, Big Farm.

The following days we worked with two men less who all worked with willingness, and would have put the building to a successful finish in 6 days, but on account of the death of old Mr. MacRae, who lived many years of usefullness and died at the age of 86 years. We therefore postponed work on the building until the following week.

The Big Baddeck River rises very quickly during heavy rains, so we were obliged to turn out one night at 10 P.M. to pile all the lumber on the top of the aero shed. I don't wish to convey the idea that the aerodrome will be in any danger from high water, because the last flood they had, which was the worst they ever had, only rose to a height of two feet at the barn adjoining the acre shed. This would only come up to the top of the wheels of the aerodrome, which would not disturb the machine, because there would be no current inside the shed.

300

During our stay at Big Baddeck, we stayed with Mr. MacRae (Big Farm), and too much can't be said in their praise for the kind manner they used everyone.

Kl.

Sept 11 :— Made a very successful trip to Big Baddeck Sept 9. Arrived at the new aerodrome shed at noon. Put up the trus?-rod? to support the heavy roof, the building having one large door 10 × 55 ft. Also put the canvas doors up.

We made the return trip in two hours, arriving at BB Laboratory at 4.46 P.M. The round trip was made in Dr. Bell's motor boat Gauldrie.

Kl.

Completion of Baddeck No II.

Sept 11 :— This day will mark the date of the successful finish of Baddeck No. II at the factory of the Canadian Aerodrome Co.

All necessary preparations have been made to transport the aerodrome to the new testing grounds at the Be?dick Farm on Monday Sept 13 if weather permits.

I can feel assured that all the men who worked with us on the construction of Baddeck No II will join me in congratulating Messrs. Baldwin and McCurdy, and in wishing all success to the Drome and her successors.

Kl.

301

Baddeck No II leaves Beinn Bhreagh .

Sept 13 :— Took Baddeck No II out to the Bentick Farm to-day. She was placed on the Get-Away and towed by the Gauldrie; while Casey, Gardiner Hubbard, Cox, and W.P. McCurdy, and myself went out in the Piper. Four men stayed out at the grounds to-night, and will go right ahead and get the surfaces on.

McC.

Sept 14 :— Douglas, Casey, and Gardiner Hubbard went to-day to Big Baddeck to look after the new Drome Baddeck No II which is now there. The Ugly Duckling house-boat is to be sent there to-morrow to afford a camping place for me.

AGB.

Sept 15 :— Gardiner, Casey and I returned in the Piper from the flying grounds this afternoon.

The machine is well under way. The top surface all on, the power plant installed and front control in place.

A flat tail has been substituted for the curved tail.

Mr. Bell's house-boat arrived at the grounds about noon.

We slept in the shed and were quite comfortable last night in spite of the cold. Sugar-coated-cook-Hubbard however, acknowledged in the morning that his slumbers were a la North Pole. We expect to return again to-morrow noon. McC.

302

Departure of the Drome Baddeck No. II from Beinn Bhreagh for the Bentick Farm, on board the Get-Away and towed by the Gauldrie. Photo by J. McNeil.

Baddeck No. II on board the Get-Away. Photo by J. McNeil.

303

BEINN BHREAGH FARM DEPARTMENT.

The Zulu Sheep .

Sept 15 :— Mr. Manchester left last Sunday night (Sept 12) for Halifax to look after the Zulu Sheep. He has not returned yet, but the following letter from Halifax was received here this evening:—

Sept 14 :— As you are aware, the month of quarantine for the Zulu Sheep, expired yesterday the 13th inst; but still they are detained.

It seems that people importing animals from any part of the world other than the United States and Newfoundland, must first obtain a permit from the Minister of Agriculture, stating the number and kind of animals to be imported etc., as stated in Sec. 7 of the Regulations relating to Animals' quarantine, which booklet I am mailing to you.

In a letter from Ottawa received by Dr. McPatridge dated Sept 9, they made the following statement: — "As far as can be ascertained in this office no permit has ever been issued to Prof. Bell for this importation", and they also wanted an explanation from the Dr. as to why they were allowed to be landed in Halifax without the necessary permit.

Dr. McPatridge has written and explained, but, on my arriving here yesterday at 12 A.M. I got him to telegraph Ottawa. The following message was sent by him:— "Shall I release Dr. Bell's sheep without permit", to which the following was received this A.M.

"Dr. Bell's sheep must be detained in quarantine pending your explanation their admission without permit".

So it seems they are waiting for the Doctor's explanation, an answer to which should be received to-morrow the 15th inst; and if satisfactory and received in time, I will leave to-morrow; for everything is in readiness for shipment.

"Admiral Anson", the five-nippled ra?, is still pretty sick, but recovering. The rest are looking very well.

(Signed) Percy Manchester.

304

This is the first time I have heard that a permit from Ottawa must first be obtained before we can import sheep for the improvement of stock.

AGB.

Sept 16 :— I have just sent the following telegram to Dr. McFatridge V.S. Inspector of Live Stock, Halifax, ?S:—

Sept 16 :— "Manchester's letter just received conveys first intimation that a permit from Ottawa is necessary before importing sheep into Canada for the improvement of stock. Kindly ask Manchester to act for me and make such application to Ottawa as may be necessary.

(Signed) Graham Bell. AGB.

BEINN BHREAGH ITEMS .

Sept 8 :— I met Dr. Butler to-day in town. He was one of the young men who visited Beinn Bhreagh in the yacht "?A. McCosh". Dr. Butler was on board the Herlaw on route to New York from Labrador; and regreted that he could not have time to come to Beinn Bhreagh, but wished to be remembered to everybody here.

WFB.

Sept 8 :— Mr. and Mrs. George Kennan and Mrs. Ellsworth took afternoon t?? at BB Hall.

AGB.

Sept 8 :— Mr. and Mrs. Richelberger, and Mr. and Mrs. Gilbert H. Grosvenor called at BB Hall this evening. Mr. and Mrs. Richelberger return to the States to-morrow.

AGB.

305

Second Quoit Game .

Sept 9 :— Results of the second Quoit game played at the Laboratory:— Terms:— J. McLean, and J. McIver for BB Laboratory and Farm; W. ?. Rudderham and K. Ingraham for Canadian Aerodrome Co.

McLean 32 6 woods McIver 33 7 woods 65 13 woods Rudderham 29 7 woods Ingraham 27 4 woods 56 11 woods

WFB.

Sept 9 :— Mrs. Edwin A. Grosvenor has been confined to bed for a day or two past.

AGB.

Sept 9 :— Mr. and Mrs. Richelberger left Beinn Bhreagh to-day on their return to the States.

AGB.

Sept 9 :— Mr. Gilbert H. Grosvenor left for Sydney to meet Peary.

AGB.

Sept 9 :— Old Mr. MacRae, of the Bentick Farm, was buried last Sunday (Sept 3). Mr. F.W. Baldwin, Mr. Douglas McCurdy and Mr. J.C. Davidson attended the funeral. Dr. and Mrs. Bell sent flowers.

AGB.

Arrival of Mr. Gardiner Hubbard .

Sept 11 :— Mr. Gardiner Hubbard arrived at Beinn Bhreagh this evening. He is a nephew of the late Hon. Gardiner Greene Hubbard, (Mrs. Bell's father). It is about been in the Phil??.

306

Sept 14 :— Mr. Gilbert H. Grosvenor has returned from Sydney, where he went last week in hopes of meeting Peary. Commander Peary, however, has not arrived and is not expected at Sydney for some days yet.

AGB.

Sept 14 :— Mr. Smith of North River St. Anne's called at Beinn Bhreagh to-day.

AGB.

Wild Geese at BB .

Sept 14 :— A flock of wild geese, numbering about 35 passed over Beinn Bhreagh towards their Southern house.

J. McK.

Sept 14 :— Mrs. McDonald spent the afternoon with her daughters Misses Annie and Sarah McDonald.

ARU.

Sept 14 :— Mrs. Carmichael of Tarbot St. Anne's visited her sister, Mrs. Grace Michels this afternoon. She was accompanied by her brother-in-law Mr. Carmichael.

ARU.

Sept 15 :— Miss Christine McLellan is spending a week with her parents in Baddeck.

ARU.

A Military Ball in Town .

Sept 15 :— Mr. and Mrs. F. W. Baldwin and Mr. Douglas McCurdy went to town this evening to attend the Military Ball in Masonic Hall given by Col. John MacRae of the 94th Regiment. AGB.

Sept 15 :— A prayer meeting was held this evening within sound of the Military band at Masonic Hall. It is reported that the officiating minister wept at the wickedness of the young people of Baddeck in dancing at a ball. They are evidently bound straight for perdition. XYZ.

307

BEINN BHREAGH FARM DEPARTMENT .

The Zulu Sheep Arrive .

Sept 18 :— The Zulu Sheep arrived this morning. The old ram “Admiral Anson” seems pretty sick; the other sheep though believed to be all well look pretty badly. They have evidently had a hard time of it getting here. AGB.

Importing Stock into Canada .

Sept 20 :— By reading Farm Notes on page 303 of last weeks Recorder, you will see that it is necessary to get a permit from the Minister of Agriculture at Ottawa before importing animals from any part of the world other than the United States and Newfoundland.

Dr. Bell did not know that such was necessary, and nothing was heard about a permit until I arrived in Halifax on Monday the 13th, and as the quarantine period had expired, was expecting of course to start back for Beinn Bhreagh at once with the sheep, but Dr. McFatridge informed me that I could not leave just yet. He stated, I have a letter from the authorities at Ottawa wanting an explanation as to why I allowed the sheep to land from the steamer without a permit. This no doubt was a bad blunder for the Doctor to make, and might get him in severe trouble, but however it was lucky for the sheep as they would have had to remain on the steamer cooped up until a permit was received.

308

Dr. McFatridge wrote the Minister at Ottawa, but I do not know what explanation he gave for allowing them to land. As he was not likely to get an answer from the Minister for two or three days, I thought it was advisable to have him wire, and the following message was sent to Ottawa:—

Halifax, H.S., Sept 16 :— Shall I release Dr. Bell's sheep without permit.

(Signed) S.H. McFatridge.

In reply to the above telegram the following was received by Dr. McFatridge at Halifax:—

“Dr. Bell's sheep must be detained in quarantine pending your explanation their admission without permit.”

It was evident therefore that they had not received Dr. McFatridge's letter. I anxiously waited for word until 11 P.M. Wednesday, and not receiving any sent the following message to Ottawa:—

“Please wire at once collect when I can have possession sheep.

(Signed) P. Manchester For Dr. A.G. Bell.

On Thursday at 1 P.M. I got a wire from the Minister to take possession of sheep, and I left Halifax with them at .30 P.M. and arrived at Beinn Bhreagh on Saturday at 12 A.M.

“Admiral Anson” is still very sick, so far there is not much change for the better. PM.

309

Ram Admiral Anson .

Sept 20 :— The ram “Admiral Anson” was on the pasture to-day and we were encouraged to observe that he walked about a little and nibbled a little grass. For some days past he has not eaten anything voluntarily and has been fed gruel from a bottle. At quarantine he was too weak to stand up. It is therefore encouraging to note that to-day he is walking about a little and nibbling grass. AGB.

Sept 21 :— “Admiral Anson”, I think, is much better; he has eaten a little oilcake, also a little cracked oats.

PM.

310

BEINN BHREAGH NURSERY .

Sept 17 :— As the farmers around now see that raising multi-nippled sheep is a paying proposition, this Fall I have already had a great many applications for the services of our rams among their flocks, and as the majority of the farmers rate their flocks in December, although we have 14 rams all having six, seven and eight nipples, still they are limited.

As we wish only to recommend those having the six-nippled blood well in them, which we expect to get the best results from, I have seen it advisable to issue the following letter to fourteen farmers in the vicinity of Baddeck and Big Baddeck.

Letter to Farmers .

Beinn Bhreagh Nursery, Sept 14, 1909 :—As there are so many farmers who wish to have the use of our rams this Fall, it will be necessary for me to have some idea at about what date in the season you wish to breed, so as I can arrange as near as possible so as not to disappoint you.

Our rams are limited in number, and we are anxious to accommodate all if possible.

(Signed) John G. Davidson, Superintendent.

Work of HB nursery for Week ending Sept 18 .

Sept 17 :— Digging of gravel in gravel pit in preparation for renewing of pergola walk; cleaning o? sheep in preparation for photographing of nipples; transplanting of 311 some asparagus; mowing and cleaning of lawns and driveways; general weeding of flower beds and shrubs. JGD.

Many Potato Bugs .

Sept 17 :— Potato bugs seem to be more numerous this year than ever before seen on Beinn Bhreagh. I understand they are numerous all over the country. After repeated doses of paris-green they still exist and have left the potatoes and attacked the tomatoes. In fact they have even attacked the flowers this summer, something which has not been previously observed, but we are getting them pretty well under control. JGD.

312

DEPARTMENT OF BUILDINGS AND WHARVES .

Winter Coal for Beinn Bhreagh

Sept 17 :— Schooner "Leila Linwood", Capt. Jackson, arrived at Central Wharf Thursday 16th with the winter's supply of soft coal for different parties on Beinn Bhreagh.

CCB.

Mrs. Frost's Cottage .

Sept 20 :— The plane for new Bungalow at Crescent Grove have been approved of by Mrs. Bell and Mrs. Frost, so we staked out the site this morning. CCB.

Saw-Mill .

Sept 20 :— The saw-mill has been running the past few days cleaning up the last of the logs, preparatory to offering the whole outfit for sale. CCB.

Contract for Wiring BB Hall Awarded .

Sept 20 :— The contract for a new system of electric bells etc. at ?B Hall was given Sat. 18th to Mr. John McDonald, Electrical Contractor of North Sydney. CCB

Acetylene Plant .

Sept 20 :— I have lately received from the Carbide Company one dozen Bray's Elta burners for acetylene gas fixtures. These can be turned down to the lowest glimmer 313 without injury, and are unlike the common burner. A saving of gas can thus be effected as the full power of the light is not always necessary. CCB.

314

BEINN BHREAGH ITEMS .

Visitors at Beinn Bhreagh Hall .

Sept 15 :— Miss Adams of Glace Bay, Miss Manual of Boston, and Mrs. John McDermid were visiting at Beinn Bhreagh Hall this afternoon. AHU.

Gen Drury arrives in Baddeck .

Sept 16 :— Gen Drury has arrived in Baddeck. I telephoned him this evening inviting him to visit BB to-morrow afternoon after the Review of the troops at Big Baddeck. He will dine with us to-morrow. Mrs. Bell is making arrangements to allow some of her girls to go to Big Baddeck to-morrow to see the Review.

Gen Drury visits BB .

Sept 17 :— Gen Drury, who reviewed the troops at Big Baddeck came over to BB in the evening. He looked over Laboratory and factory and drove over mountain. Took dinner at BB Hall, and met Mr. and Mrs. G. H. Grosvenor, Mrs. E.A. Grosvenor, Mrs. F.W. Baldwin, Miss McRae, besides Mrs. Bell and myself. Gen Drury returned to Baddeck after dinner.

AGB.

Sept 18 :— Miss Christine McLellan returned to-day after spending a pleasant week at her home in Baddeck. AHU.

Sept 18: — Miss Darling of Toronto arrived at BB this evening on a visit to Mrs. F.W. Baldwin. AGB.

315

Sept 21 :— Dr. Bell's mother would have been 100 years old to-day had she been alive. AGB.

Miss Winifred Darling .

Sept 21:— Miss Winifred Darling of Toronto, arrived at BB Saturday evening last from Scarborough Beach, Maine, where she has been spending the summer.

The Bungalow being minus a maid Mr. and Mrs. Bell, with their usual kind hospitality, came nobly to the rescue and welcomed our guest with open arms, which is very much appreciated by me.

Miss Darling is entranced with Beinn Bhreagh, with its lovely garden and beautiful drives. In fact everything has given her unbounded pleasure.

To-morrow we intend sailing up to ?yanza in the Scrapper where we hope to meet Casey at 4 o'clock D.V.W.P. and he will take us up from there in the Piper to their camp at the B?ntick Farm. KSB.

Sept 21 :— Fine display of *Aurora borealis* visible here this evening at seven minutes past eight covering the northern half of the sky, and extending up to the zenith. Whole northern sky covered from east to west; southern half clear. The western edge of the luminous curtain passes through the bright star alpha lyr?s . Gentle streamers go up from all points of the northern half of the horizon to a point in the northern cross which seems to be overhead. AGB.

316

BEINN BHREAGH LABORATORY .

Water Propeller for Query .

Sept 15 :— Received to-day from Boston a water propeller for the Query. It is a "Harthan" left hand wheel with three blades, 16 inches in diameter and 30 inch pitch.

WFB.

Work on Oion?s Model .

Sept 15 :— We are coating the surfaces of the Oion?s model with a mixture of linseed oil and turpentine colored with equal parts of dry burned Seinna and dry Vermillion.

We also started to-day to make up the tail for Oion?s model as shown in drawing. The dimensions of the tail are 61 cm × 1?2.4 cm, and it is placed 103 cm behind the center surface. WFB.

Repairs on Annex .

Sept 15 :— I find that it is necessary to make some repairs to the skylights on the Annex roof. Mr. Stewart and Mr. Watson both of whom have been working for a day on the roof found that the zinc flashings were completely worn out. They put in new flashings which necessitated the shingles being removed. WFB.

Sept 15 :— Mr. Ross, machinist at ?B Laboratory returned to-day from Baddeck, where he has been employed for a day or two making some repairs on the electric light plant at McKay and MacAskill's store. WFB.

317

Photographing Nipples of Sheep .

Sept 15 :— John McNeil and I went to the Point this morning and took photographs of the nipples of fifteen sheep at Beinn Bhreagh Nursery. These photographs being for Dr. Bell's personal use will be printed and developed in the Laboratory dark room. WFB.

Experiments with Query.

Sept 16 :— Made an experiment with the Query towed behind the Piper. The following men were on the Query:— Ross, McLean and Bedwin.

The speed attained was 15 miles an hour; pull 136 lbs. Two sets of hydroplanes were used with no engine on board Query. WFB.

Sept 16 :— We have a water propeller for the Query (16" diameter × 30" pitch). The engine has been taken out and we will make an experiment to determine her proper trim by towing behind the Piper. FWB.

Sept 18 :— Made series of experiments with Query towed by the Piper. Get a number of readings of pull and speed with hydro-surfaces; also got some slower speeds by towing with the Sworm. Mr. Baldwin took possession of the records of the experiments; also table of weights of Query and her load.

WFB.

Sept 18 :— Made some towing experiments with the Query at different speeds. Idea is to get enough readings to give a satisfactory resistance curve. A comparison between the curves of resistance with and without hydro-surfaces 318 should give some useful information.

The weights carried on the Query were equal to that of man and engine. FWB.

Oionos Model .

Sept 18 :— The framework for the tail of Oionos model is finished and ready to cover. Men are now at work on the attachments to fasten the tail to body of structure. I have also been at work on drawings for bow of machine. WFB.

Overhauling eight cylinder engine .

Sept 20 :— We are giving the eight cylinder engine an overhauling and find that there are several piston rings broken and some stuck. Have sent to Hammondsport for some new rings. WFB.

319

Bedwin's sketch of the tail attachment to the model of the Oionos Drome. Photo by J. McNeil.

320

138120-A

1909 SEPT 21 Hydro-surfaces employed on the Query in experiments Sept 18. Photo by J. McNeil.

138179-A

1909 SEPT 21 The Query fitted with her hydro-surfaces as in the experiments of Sept 18. Photo by J. McNeil.

321

CANADIAN AERODROME COMPANY .

Sept 16 :— Mr. Baldwin, Mr. McCurdy, and Mr. Gardiner Hubbard went to the Bentick Farm to-day. They are staying all night. ACB.

Sept 17 :— Mr. Baldwin, Mr. McCurdy, and Gardiner Hubbard have been out at the Bentick Farm all day, and have not yet returned. They were away last night and will evidently camp out there to-night. ACB.

Sept 18 :— Mr. Baldwin, Mr. McCurdy, and Mr. Gardiner Hubbard returned from Big Baddeck this afternoon.

McCurdy reports that Baddeck No.II was run over the testing grounds to test engine and propeller. A wire in central section broke, and they are to replace the wires there with straps of iron to strengthen the section. AGB.

Gen Drury visits Testing grounds at Big Baddeck

Sept 18 :— Yesterday afternoon we were visited at the flying grounds by Gen Drury, who was at Baddeck inspecting the Militia, who are encamped at the Big Baddeck River Valley.

Towards evening the machine was taken out on the grounds and mounted by Casey who ran her over the s?d a couple of times. These trips were brought to a close by the breaking of the wires. We have decided to replace these wires by $\frac{1}{8}$ " \times $\frac{5}{8}$ " band iron which will make a very strong brace. The machine will be ready to try further by Monday night. McC.

322

1909, Sept 22, Sept 20 :— Mr. Baldwin, Mr. McCurdy, and Mr. Gardiner Hubbard went to the testing grounds at Big Baddeck to-day and will stay all night. AGB.

Sept 21 :— Mrs. Bell, Mrs. Baldwin, Miss Darling, Miss McRae of Washington accompanied by Sandie and Melville drove to the testing grounds at Big Baddeck to-day. They report that some experiments were made with Baddeck No.II, but that it did not leave the ground. No report has been received as yet from McCurdy or Baldwin, who still remain at the testing grounds over night. AGB.

Sept 22 :— Mrs. Baldwin and Miss Darling have started for the testing grounds by water, and I have asked Mrs. Baldwin to act as reporter for the Recorder and bring back notes concerning what has been done there the last day or two. AGB.

Sept 24 :— No word received as yet from Big Baddeck. Mrs. Baldwin and Miss Darling have not yet returned, nor have Douglas, Casey, or Gardiner shown up (11 P.M.) AGB.

Sept 24 :— Mr. Ingraham came in from the Bentick farm to-day and brought a few notes with him for the Recorder in relation to what has been going on at Big Baddeck. These notes were made by Mr. Ingraham Sept 19, and as the Beinn Bhreagh Recorder is for records as well as news, I give them below although they do not come in order as to date. CBC.

Sept 19 :— In general we have had fairly good success in getting Baddeck No.II ready for a flight, and it is expected that the machine will be ready for a trial in a few days. KI.

323

1909, Sept 24, Sept 19 :— Camping out at Big Baddeck is being enjoyed by all, and I would certainly recommend this place to any one in search of an appetite. Kl.

Arrival of House Boat at Big Baddeck .

Sept 19 : Dr. Bell's House boat has arrived at Baddeck River and is attracting a great deal of attention in the neighborhood. If I remember rightly this is not the first time that this boat has attracted attention. Some three years ago when the "Ugly Duckling" was put into commission, which boat was supported by the copper floats now used on the House boat at Baddeck River, the people of Baddeck were somewhat surprised in seeing a boat propelled through the water by means of an aerial propeller. Later on the "Ugly Duckling's engine and propeller were removed and the boat was used for launching the man-lifting kite Cygnet, which successfully carried the late Lieut. Selfridge into the air in December 1907.

It can be plainly seen therefore that this floating House boat was figured a great deal in experimental work at Beinn Bhreagh. Kl.

George McKenzie off for School .

Sept 19 :— George H. McKenzie, who has worked this summer for the Canadian Aerodrome Company has left for Boston to attend the Massachusetts Institute of Technology. We all wish George every success in his new field of study.

Kl.

324

into the this evening, but on account of the short distance he had to run he was unable to do so. Kl.

Experiments with Baddeck No II .

Sept 24 :— Friday, Sept 17 was the first evening we took the machine out. In running the machine over the ground it was found that some of the wires had slackened up, and the machine was brought back to the shed to tighten these wires up. On the following day (Sept 18) the machine was

again taken out, and as the previous day other wires were found slack. All these wires have now been replaced with stronger ones.

The machine runs very fast over the ground, but does not produce very much lift on account of small angle. Messrs. Baldwin and McCurdy have therefore decided to give the machine a greater angle, in order that it might produce more lift, and thereby lessen the shock to the machine.

The machine has been out every day since Friday (Sept 17), but no attempt has been made to put the machine into the air as some little thing each day had to be replaced and made stronger. Kl.

Sept 24 :— Mr. Baldwin tried to put Baddeck No II into the air this evening, but on account of the short distance he had to run he was unable to do so. Kl.

325

1909, Sept 25, EDITORIALS AND ARTICLES .

Suggestions Concerning Tail of Baddeck II .

(A letter from A G Bell, BB, to Messrs. Baldwin and McCurdy at the testing grounds at Big Baddeck).

Sept 24 :— I have been impatient to hear news from the testing grounds. Have just seen Ingraham, and I rather think, from what he says, that you are finding some difficulty in getting off the ground, and propose increasing the angle of attack of the main surfaces.

I understand also from him that you are using a flat tail depressed at the rear.

Now this tail acts as a depressed rudder when the machine has headway, tending to steer the head down when the machine advances, thus increasing the difficulty in getting off the ground.

I have the feeling that the great function of a flat tail is to keep the machine on an even keel with the engine thrust horizontal. In my opinion this means that the surface of the tail should be parallel to the engine thrust, and not at an angle to it. In other words the tail should be horizontal when the machine is running on the ground.

If it is titled up or down permanently, I think it loses its stabilizing action, tending to steer the machine continuously either upwards or downwards; and thus interferes with its principal function,

namely, to make the 326 engine-thrust horizontal, when from any cause the machine departs from the horizontal position.

The thought occurs, that it might perhaps take loss labor to try the effect of the horizontal tail, then to change the angle of the main supporting surfaces.

Miss McRae, Miss Anna Urquhart accompanied by Sandie and Barbara Fairchild left this morning for Montreal. Mr. and Mrs. Fairchild reached Quebec yesterday, and will join them on the train as they pass through.

Please ask the special correspondent of the BB Recorder what has become of her report. The Recorder has to go to press without it.

I enclose two telegrams that have come for you from newspaper men. I have not replied to them, leaving this for you to do, as I did not think it advisable to stir up the newspaper men until you have got over the preliminary fussing over details. Otherwise you would be in the position you were in at Petewawa, of having to make your preliminary experiments in public. Better wait until you have made a satisfactory hop, before you let the newspaper men know that you are doing anything. "Thems my sentiments". AGB.

327

TABLE VII: The ages of the Mothers of lambs born 1890–1909

Year of Birth	Age of Mother when lamb was born	1 yr	2 yrs	3 yrs	4 yrs	5 yrs	6 yrs	7 yrs	8 yrs	9 yrs
un-kn	1890	5	9	5	14	23	12	4	1891	4
		11	7	5	22	20	9	1892	3	17
		9	7	6	12	11	6	1893	18	15
		8	6	5	1894	1	6	3	3	1
		1895	11	6	4	2	3	1896	2	12
		9	3	1	1897	?	7	1	7	?
		1	2	1898	3	10	7	1	6	10
		1899	1	9	16	8	?	4	1900	9
		8	9	9	1	5	4	1901	2	6
		5	1	2	3	1902	7	6	10	10
		10	10	9	1903	1	2	14	6	9
		7	8	7	1904	7	2	11	4	4
		1	5	28	1905	2	9	7	?	5
		1	4	1906	4	3	6	?	2	6
		2	1	6	1907	6	4	4	5	6
		1	6	2	2	1908	11	5	3	3
		4	4	1	3	1	2	1909	13	12
		4	5	1	1890–94	13	61	39	37	60
		46	29	13	5	1895–99	12	39	42	29
		19	20	6	1900–94	1	27	36	41	40
		27	24	18	3	28	1905–09	36	33	24
		24	18	12	9	6	1	14	1890–99	25
		100	81	66	79	68	3?	13	5	1900–09
		37	60	60	66	58	39	33	24	4
		42	Total	62	160	161	131	137	107	68
		37	9	42						

Note:— For tables I to VI see pp 281–286. A.G.B.

328

TABLE VIII: The ages of the Mothers of twin lambs b 1890–1909

Year of Birth	Age of Mother when lamb was born	1 yr	2 yrs	3 yrs	4 yrs	5 yrs	6 yrs	7 yrs	8 yrs	9 yrs	
un-kn	1890	0	2	2	6	16	6	4	1891	0	
		0	0	0	4	12	15	4	1892	0	
		0	0	2	0	0	4	2	4	1893	0
		0	0	0	0	0	0	0	0	0	
		4									

1894 0 2 0 0 0 0 1895 0 0 2 0 0 1896 0 4 6 0 0 1897 0 0 0 4 6 0 2 1898 0 0 2 0 4 10 1899 0 2 8
4 4 0 1900 0 2 4 6 0 2 2 1901 0 0 0 2 0 0 0 2 1902 0 0 2 4 2 2 1903 0 0 0 0 0 2 2 2 1904 0 0 4 0
0 0 0 2 1905 0 0 0 2 0 0 4 1906 2 0 0 2 0 2 0 0 5 1907 0 0 0 0 0 0 2 2 2 1908 0 0 0 2 2 4 0 2 0 2
1909 2 6 2 4 0 1690-94 0 4 4 10 28 25 10 4 4 1895-99 0 2 14 16 10 14 2 1900-04 0 0 2 10 12 4
6 4 2 2 1905-09 4 6 2 10 2 6 2 4 0 13 1890-99 0 6 18 26 38 39 12 4 4 1900-09 4 6 4 20 14 10
8 8 2 15 Total 4 12 22 46 52 49 20 12 6 15

Note:— Among the twins are included 6 triplets (2 sets of triplets). A.G.B.

Symbols:— “-” means that no lambs were born; “0” means that lambs were born, but were not twins.
AGB

329

TABLE IX: Relation of Fertility to the age of the Mother

Age of Mother when lamb was born. Lambs Per cent Total Single Twin Twin Summation 894 655
238 26.6% Unknown 42 27 15 Known 852 629 223 26.1% 1 yr 62 58 4 2 yrs 160 148 12 7.5%
3 yrs 141 119 22 15.6% 4 yrs 131 85 46 35.1% 5 yrs 137 85 52 37.9% 6 yrs 107 58 49 46.8% 7
yrs 68 46 20 8 yrs 37 25 12 9 yrs 9 3 6 1-2 yrs 222 206 16 7.2% 3-4 yrs 272 204 68 25.0% 5-
6 yrs 244 143 101 41.4% 7-8 yrs 105 73 32 30.5% 9— yrs 9 3 6 1-3 yrs 363 326 38 10.5% 4-6
yrs 375 228 147 39.2% 7-9 yrs 114 76 38 33.3%

Note:— Among the twins are included & triplets (2 sets of triplets). Percentages are not given in
cases where the total lambs born are less than 100. AGB

330

TABLE X: The month of birth of lambs born on BB 1890-1909

Month of Birth Year of Birth Total Lambs Feb. or Earlier March April May June or later Unknown
1890 72 10 61 1 1891 78 4 65 9 1892 71 16 42 13 1893 67 9 52 6 1894 17 9 7 1 1895 26 2 5 18
1 1896 27 22 4 1 1897 34 28 4 2 1898 37 2 27 8 1899 43 30 12 1 1900 45 36 6 3 1901 32 29 3
1902 52 20 8 24 1903 54 2 22 27 2 1 1904 62 2 11 13 31 6 1905 31 3 25 2 1 1906 38 4 29 3 1
1 1907 36 5 24 4 1 2 1908 37 2 24 2 9 1909 36 27 8 1890-94 305 14 160 110 21 1895-99 167
4 107 33 20 3 1900-04 245 4 118 57 36 6 24 1905-09 177 14 129 19 12 3 1890-99 472 4 121
193 130 24 1900-09 422 18 247 76 48 9 24 Total 894 22 368 269 178 33 24

Note:— The unknown cases were born in March or April. AGB

331

TABLE XL: The month of birth of Twin lambs b on BB 1890-1909

Month of birth	Year of Birth	Total Lambs	Feb. or Earlier	March	April	May	June or later	Unknown						
1890	36 8 28 0	1891	35 0 33 2	1892	12 2 10 0	1893	4 0 4 0	1894	2 2 0 0	1895	2 0 0 2	0	1896	10 8 2 0
1897	12 12 0 0	1898	16 2 12 2	1899	18 16 2 0	1900	16 16 0 0	1901	4 4 0	1902	10 6 2	2	1903	6 2 2 2
0 0	1904	6 0 0 4	0 2	1905	6 2 4 0	0 0	1906	11 2 9 0	0 0	1907	6 0 4 0	0 2	1908	12 0 12 0
0 0	1909	14 12 2	1890–94	89 8 65 16	0	1895–99	58 2 48 6	2 0	1900–04	42 2 28 8	0 2 2	1905–09	49 4 41 2	0 2
1890–99	147 2 56 71	18 0	1900–09	91 6 69 10	0 4 2	Total	238 8 125 81	18 4 2						

Note:— “Twins” include 6 triplets (2 sets of triplets). The “unknown” cases were born in March or April. AGB

332

TABLE XII: Relation of Fertility to the Season of Birth

Month of Birth	Total Lambs	Twins	Per cent Twin	Summation		
894	238	26.6%	Unknown	24 2		
Known	870	236	27.1%	Feb. or earlier	22 8	
March	268	125	34.0%	April	26 81	
30.1%	May	178	18	10.1%	June or later	33 4
March or earlier	390	133	34.1%	April	260 81	
20.1%	May or later	211	22	10.4%		

Note:— “Twins” include six “triplets” (2 sets of triplets). The “unknown” causes were born in “March or April.” Percentages are not given in cases where total lambs born are less than 100. AGB

333

1505 1505 Bf 6n s

1606 1606 wf 6n tw

1706 1706 Bf 6n s

1734 1734 wf 7n s

The older multi-nippled ewes living August 17, 1909, see page 134. Nipples photographed by J. McNeil.

334

17B 17B wf 6n tw

180? 1805 wf 6n tw

18A 18A wf 6n tw

The older multi-nippled ewes living August 17, 1909, see page 134. Nipples photographed by J. McNeil.

335

AVIATION WEEK AT .

Sept 21:— My niece, Mrs. Julian Ripley, formerly Miss Helen Bell, was present at Rheims during Aviation Week; and Mr. Julian Ripley has sent me an interesting note concerning his impressions of the Aviation Week at Rheims, from which I quote the following:—

Aug. 30:— You wrote that you would like to hear a few impressions of the Aviation Week at Rheims, and I will try to condense a few ideas I got. You will undoubtedly have followed the results in the papers so I shall not go into any descriptions.

First, it is evident the serious effect that the slightest breeze has on all the aeroplanes.

When Curtiss flew for the Cup there was no apparent stirring of the air, and the instruments measured it as under three meters a second. Yet Curtiss said that when he got going, the air seemed boiling, and he was nearly thrown from his seat.

We went in to see him and had a pleasant chat with him, and he wanted us to remember him to you.

His machine compares well with the others; very much more compact than the other biplanes; and his motor worked very regularly, and gave him practically no trouble. He never was forced to come to the ground against his will which no one of the others could say.

The monoplanes of course had the popular favor. It is absolutely impossible to convey in words the graceful beauty of their flights, especially the one driven by Latham who soared aloft with his Antoinette monoplane with all the poise and balancing motion of a great eagle.

It is a fact to be noted that the best records were held by men who flew their own machines which they had designed and built.

Curtiss, in the Cup race and speed race, both of which he won, and came in second in the 10 kilometer race. Bleriot, on his own machine, won the 10 kilometers; and would have won the 30 kilometers but for the accidental destruction of his aeroplane. 336 Farman won the distance race, covering 180 kilometers, on his own aeroplane; also the passenger race taking two passengers.

The Wright machines did no do so well as I had expected; but I imagine, if either of the Brothers had been on board, the result might have been different. As it was, they did not seem as steady as some of the French biplanes, notably those of the box-kite construction.

As to motors, there was one called the Gnome, of French construction, which Farman used that seemed to do especially well. It has seven cylinders, I think, which revolve around a common center, lubricated by force pump; and the movement helps to keep them cool.

We met Sir Hiram Hazim, who also wished me to remember him to you. He claims to have a motor far lighter than any that have been used here, and perhaps has in mind to go in again for aeroplanes. He thinks that this meeting will do more to stimulate Aviation than anything that has yet been done, as it will be realized now, that flying is an accomplished act.

I am most interested in what you say about your "Oionos", and hope to have you tell me about it when we get back.

(Signed) Julian P. Ripley.

Mr. Julian Ripley is the proprietor and editor, of the "Burr McIntosh Monthly", and of "Recreation".

I give on the next page a photograph of the Curtiss aerodrome, copied from the "American Machinist" for July 8, 1909. I presume this is the machine Mr. Curtiss used during Aviation Week at Rheims, or one similar to it. AGB.

Note:— This issue of the Recorder pp 307–336 has been edited by Mr. Charles R. Cox. AGB.

337

Curtiss' Aerodrome copied from "American Machinist for July 8, 1909, page 50, by J. McNeil.

Curtiss' Aerodrome copied from "American Machinist" for July 8, 1909, page 50, by J. McNeil.

338

1909, Sept 30, BEINN BHREAGH FARM DEPARTMENT .

Harvesting on Farm .

Sept 29 :— We have been, and still are having beautiful weather for harvesting. During the last week we have been very busy cutting and hauling in oats, besides building a temporary shed for the Zulu Sheep. Some of the men have also been employed at ploughing, fixing roads, fences, etc.

Up to date we have placed in the large barn twenty-one loads of oats, and five loads of barley, making in all 26 loads of grain. In the field we have still about fifteen loads of oats most of which has already been cut down, and if the weather continues fine for the next day or two, I think we will have all the grain placed in the barn.

Need of more barn room .

Sept 29 : We are going to be very short of barn room for all of our crops this year. We have already filled up both mown, and it now becomes necessary to put considerable grain on the barn floor, which can be readily seen is very inconvenient.

If the crops on Beinn Bhreagh Farm keep increasing, it will be found necessary to build an addition on to the barn. PM.

339

BEINN BHREAGH NURSERY .

Sept 25 : Flowers have been cut this afternoon for Beinn Bhreagh Hall, the Baddeck Public Library, and Churches, as has always been the custom on Saturdays at the Nursery.

When the flowers had all been gathered together and placed in the dark room at Beinn Bhreagh Hall, Mrs. Bell came down stairs to see them, and was somewhat surprised in seeing such a quantity of them, inasmuch as it was quite late in the season. Mrs. Bell thought that it would be a good plan to send these flowers to Baddeck, care of McKay & MacAskill Company, where they could be displayed in their large show window, thereby giving the people of Baddeck some idea as to what was really being done at Beinn Bhreagh Nursery in a horticultural way.

Mr. McKay placed these flowers on exhibition, specially lighting the arc light in his large window to show them off. About 9 P.M. Saturday night Mrs. McKay distributed all those flowers not marked for the Churches, Library, etc. to the public in and around Baddeck, all of whom appreciated Mrs. Bell's thoughtfulness and kindness.

Flower display at Baddeck .

Sept 25 :— Beinn Bhreagh Nursery should feel proud of the fine display of flowers seen at McKay and MacAskill's store last Saturday evening. The fair sex turned out in large numbers to visit the store. Nearly all of them were the 340 recipients of a small bouquet presented by Mrs. McKay. One could hardly realize that such a grand display was the off-spring of an out door garden, especially at this time of the year. CRC.

Work on Beinn Bhreagh for the week ending Sept 25

Sept 25 : General work on Beinn Bhreagh for the week ending Sept 25 has been the trimming of chestnut trees on lawn; the commencement of Lily Ponds in valley below; trenching of new rhubarb bed; fertilizing and dying of asparagus bed; weeding, mowing and general cleaning up around Beinn Bhreagh Hall. One of my men has been doing the house work at Beinn Bhreagh Hall in the absence of James McKenzie. JGD.

Visitors at Beinn Bhreagh Nursery.

Sept 25 :—C. W. Irving, Halifax, J. A. Irving, Baddeck. Mr. G. W. Irving is our local bankers father, and is now en route to Philadelphia by way of St. Anne's going up on one of the plaster mine boats. JGD.

Davidson leaves for Halifax Exhibition .

Sept 30 : Mr. Davidson left Beinn Bhreagh Sunday afternoon (Sept 26) in the Gauldrie for Grand Narrows. He took the midnight train for Halifax, where he will attend the Exhibition returning sometime Friday or Saturday. CRC.

341

DEPARTMENT OF BUILDINGS & WHA??VES .

Saw Mill .

Sept 29 : Mr. McAulay of Boulardarie (la?? of the American Army in the Philippines, where he served during the entire war) called to see me yesterday about the saw mill, which he is thinking of buying.

It is expected that we shall finish all work in the saw mill to-day. CCB.

Gauldrie takes many passengers .

Sept 29 : Capt. McDonald tells me that between scholars for the Garden Party at Beinn Bhreagh Hall and others, he carried two hundred and fifteen passengers on the Gauldrie yesterday, taking in one trip (6:15 P.M.) from Central Wharf sixty-seven people. This, I should say, makes a record. CCB.

Mrs. Frost's Cottage .

Sept 29 : The lumber for the Frost Bungalow at Crescent Grove has arrived, so work will be started at once. Sam McMillan will be in charge. The window sashes which we are making by hand are already well under way. Shingles of our own manufacture will be need on this house. CCB.

Visit to Truro .

Sept 29 : Last Friday (Sept 24) I accompanied Miss McRae and Miss Urquhart with their charges, Alexander and Barbara Fairchild as far as Truro, and saw them safely 342 aboard the Express for Montreal. The traveling refrigerator which we made for them proved very satisfactory. CCB.

Visitors at Central Wharf .

Sept 29 : On Thursday (Sept 23) John McLeod, Elder, Port Bevis, and J.H. McKinnon, Beaver Cove, were visiting at Central Wharf. CCB.

Sept 29 :— On Friday (Sept 24) the following party landed here from William MacAskill's yacht "Dribble III" to visit the tower:— Hizeses Florence McLeod, Louise Crowdis, Marjorie Crowdis, Catherine McKenzie, Fannie McKay, Miss Frazer, Mrs. John McKay, and Sanford Burke. CCB.

BEINN BHREAGH LABORATORY .

Oionos Model .

Sept 22 : Work is progressing well on the Oionos model. The tail is all finished and attached, while the nose is being put on to-day. WFB.

Query .

Sept 22 : We are also at work on the Query's engine getting it into shape. We sent the new water propeller to I. Matheson & Company to have it fitted to a bronze shaft. It should be back shortly. WFB.

Experiments with Cygnet II model .

Sept 23 : Made a series of experiments with the half-sized model Cygnet II on the bay to-day. Got twenty readings of altitude and wind velocity. WFB.

Data on Oionos Model.

Sept 24 : The following data has been secured from Oionos model up to this date. Weights include tail and nose attached.

Wing piece .

Horizontal (61×380) 2 = 4.6360 m² □

Surface (103×457) 1 = 4.7071 m² □

Oblique (66×59) 24 = 9.3456 m² □

Oblique resolved to horizontal $(457 \times 59) 2 = 5.5926 \text{ m}^2$

344

Total .

4.6360

4.7071

5.5926

14.9357 m² WFB.

Weight & Ratio .

Sept 24:— Weight 22.100 kg Surface 14.9357

Ratio= $22.100/14.9357 = 1.477$

Say 1.5 kg per m² or approx. 3 lbs per sq. ft.

On pure horizontal only the ratio is:—

$22.100/4.6360 + 4.7071 = 22.100/9.3431 = 2.3 \text{ kg per m}^2 \text{ WFB.}$

Oionos Tail .

Sept 24 :— Dimensions of tail on Oionos model:— $61 \times 154 = .9394 \text{ m}^2$

Tail is placed at an angle of 5° to, and level with, the center surface, and there is a space of 103 cm between the back edge of center surface and the front edge of tail. Surface of tail is slightly convex on both upper and lower sides, and it is a single surface covered on both sides of framework. WFB.

345

Bedwin's sketch of the nose attachment to the model of Oionos Drome. Photo by J. McNeil.

346

1909 SEPT 2? Model of Oionos Drome showing tail. Photo by J. McNeil.

Model of Oionos Drome showing tail. Photo by J. McNeil.

347

1909 SEPT 25 Side view of Oionos model showing tail and nose. Photo by J. McNeil.

1909 SEPT 25 Front view of Oionos model showing nose elevated. Photo by J. McNeil.

348

BEINN BHREAGH ITEMS .

Sept 20 :— Mr. Gilbert H. Grosvenor and his mother left BB Monday (Sept 20) for the States.

AGB.

Sandy and Barbara leave .

Sept 23 :— Sandy and Barbara Fairchild accompanied by their nurses and Miss Anna Urquhart left BB this morning for Montreal. Mrs. Bell went with them as far as Iona. Mr. Byrnes took charge of the party to Truro, where he is to see them safely on the train for Montreal. Mr. and Mrs. Fairchild will board the train at Quebec, and at Montreal they change cars for the States bound for Washington, D.C.

AGB.

Thirtieth Anniversary of Mr. and Mrs. Kennan's marriage .

Sept 25 :—Dr. and Mrs. Bell dined with Mr. and Mrs. George Kennan. Mr. and Mrs. Kennan celebrated to-day the thirtieth anniversary of their marriage.

AGB.

Sept 25 :— Mr. Byrnes returned from Truro to-day. AGB.

Mrs. Bell meets Caroline McCurdy.

Sept 26 :— Mrs. Bell accompanied by Mrs. Grosvenor, Gertrude Grosvenor, Ruth Davidson, and Mr. Davidson went to Grand Narrows Sunday afternoon. Mrs. Bell met Miss Caroline McCurdy, and returned with party to Beinn Bhreagh, while Mr. Davidson remained at Grand Narrows for the mid-night train to Halifax. The party received a severe drenching on the return to Beinn Bhreagh as it was very rough, and the Cauldrie had a hard time weathering it.

AGB.

349

Sept. 26 :— Mr. James McKenzie returned this afternoon from his home at North River, where he has been spending a vacation for the last ten days.

CBC.

Sept 26 :—Mr. Manchester, Mr. Budderh?m, Mr. McLeod, and Mr. Cox spent Sunday at the River Dennis visiting their friends who are encamped near Orangedale. The trip was made in Mr. Manchester's motor boat "Rose", which proved itself to be a good sea-worthy boat. Sunday was spent at the Grand Narrows hotel as it was too rough to come under the bridge at Iona Sunday night.

CBC.

Horse Mackerel seen in Bay .

Sept 30 :— Yesterday afternoon (Sept 29), while the Gauldrie was making her evening trip to town (5:15 P.M.), three horse mackerel were noticed jumping out of the water off Mr. Campbell's shore. One of these fish appeared to be about 10 feet long. This seems to be a good sign that there are some young mackerel in the Bay.

CBC.

Dr. Bell visits Bentick Farm .

Sept 30 : Yesterday afternoon (Sept 29), Dr. Bell went across on the Gauldrie (5:15 P.M.) and was met by Mr. Dunlop at Mr. McDonald's wharf, who drove him out to the Bentick Farm. Dr. Bell intends to return to-morrow afternoon sometime.

CBC.

350

CANADIAN AERODROME COMPANY.

Sept 25:— Cacay, Douglas, Gardiner, Mrs. Baldwin, and Miss Darling are still at testing ground at Big Baddeck.

AGB.

Sept 25 :— Mrs. Gilbert H. Grosvenor drove to the testing ground at Big Baddeck to-day. John McDormid who drove her there reports that several successful "hope" were made with Baddeck II to-day, and he feels confident that the machine left the ground and flew for short distances.

AGB.

Sept 26 :— Crowd are still out at Big Baddeck.

AGB.

Sept 27 :— Crowd are still out at Big Baddeck.

AGB.

Sept 28 :— Crowd are still out at Big Baddeck.

AGB.

Sept 28 :— Mr. Ingrham returned from Bentick Farm to-day, and is now confined to his home with a severe cold. CBC.

Sept 29 :— Douglas, Casey, Mrs. Baldwin and Miss Darling returned to-day from Bentick Farm in time for lunch. They report many small flights, and will return this afternoon to resume experiments to-morrow. Mr. Bell has decided to go with them.

CBC

Letter from McCurdy to Bell .

Bentick Farm, Sept 28 :— Three flights were made to-day after the wind went down. Distance about 100–200 yards; elevation about 4–6 ft; balance seems good. Will make few more short flights before attempting anything which can be dignified by the name of flight. It ought to be fine to-morrow morning, and we will let you know what happens. Hope you are all well. We are having a jolly good time and all in best of spirits.

(Signed) Douglas McCurdy.

351

Diary kept by Mrs. Baldwin at Bentick Farm.

Sept 22 : Arrived at Hyanza on “Scrapper” 5:00 P.M. Casey met us and towed us up river to their camp. Got there at 7 o'clock. John had just given the machine a run over the ground. Did not attempt to put her in the air. Everything satisfactory. (used engine without fly wheel).

Sept 23 : Boys up at 5:00 A.M. Took machine out. Engine skipped at first, but picked up almost immediately; machine did not gain enough headway to make her ride lightly over rough ground. One guy wire broke and propeller split. Nothing had struck propeller, and the only way to account for its failure, is that it was caused by the racking the machine underwent. Wind got up about 6.00 A.M. and no more flights were made until sundown when wind dropped. 5:30 P.M. brought machine out to new stretch along the river bank to try and get smoother ground. Made two attempts to put machine into the air. On first run goes speed was attained, and front wheel lifted; machine felt light, but did not get up. Had to shut off on marshy ground. Second attempt ran back in a westerly direction along bank of river which gave 100 yards at a good speed; machine struck bumps, and after port strut of center panel gave way temporary splice made, and machine taken back to shed.

Sept 24 : Repaired center panel. Machine ready by evening, but we had to wait for Ingraham who had gone to Baddeck for the irons for the front wheel to change the launching angle.

352

Sept 25 :— Put irons on and changed the angle to about $5\frac{1}{2}^{\circ}$ or 6° . When the wind went down about 5 o'clock took machine out and made four flights of about 200 yards each from 2 to 8 feet in the air.

KEB.

Sept 26 :— To-day is Sunday. No flights were made at the Bentick Farm.

McC.

Sept 27 :—No flights were made at the Bentick Farm to-day as the wind blew hard all day from the north east.

FWB.

Sept 28 :— Tuesday afternoon about three o'clock got machine a going. Made one short flight. Broke rear port chord on the lower surface. This chord was broken in some manner over some very rough ground after a landing had been made. Took machine back to the shed and undid cloth; broken chord was spliced. Had the machine ready again just at sundown, when two very satisfactory short flights were made. The balance seemed well, and the machine answered the controls nicely.

FWB.

Sept 29 :— Took the machine out this morning and made another short flight. Turned around before start of second flight and chain spreader failed. Broken part was brought to Baddeck for repairs.

FWB.

Sept 29 :— Douglas, Casey, Mrs. Baldwin, Miss Darling, Dr. and Mrs. Bell, Mrs. Grosvenor, Gertrude Grosvenor, and Miss Caroline McCurdy have all gone to Big Baddeck this afternoon.

C?C.

353

TABLE XIII: Relation of Fertility to Color

Lambs Color	Total	Single	Twin	Mother	white	Father	white	Lambs	white	598	448	160	Lambs											
black	35	25	10	Father	Black	Lambs	white	60	40	20	Lambs	Black	2?	16	6	Father	unknown	Lambs						
white	11	7	4	Lambs	Black	1	1	Mother	Black	Father	white	Lambs	white	89	71	18	Lambs	Black	49					
29	10	Father	Black	Lambs	white	1	1	Lambs	Black	26	16	10	Father	unknown	Lambs	white	Lambs	Black	2	3	Total	594	606	238

Note:— Tables XIII, XIV, XV & XVI combine facts in tables I, II, III, IV pp 281–284. For color see table I, p 281, for fertility see table III, p 283. AGB

354

TABLE XIV: Relation of Fertility to Sex

Sex Total Single Twin Male 459 339 120 Female 435 317 118 Total 894 656 238

Note:— Tables XIII, XIV, XV & XVI combine facts in tables I, II, III, IV pp 261–264. For sex see table II, p 282; for fertility see table III, p 283. A.G.B.

355

TABLE XV: Relation of Fertility to Number of Nipples

Nipples Total Single Twin 2n 164 110 54 3n 44 27 17 4n 494 370 124 5n 101 79 22 6n 85 65 20
7n 4 ? 8n 2 1 1 9n Total ?94 656 238

Note:—Tables XIII, XIV, XV & XVI combine facts in tables I, II, III, IV, pp 281–284. For number of nipples see table IV, p 284; for fertility see table III, p 283. AGB

356

TABLE XVI: Relation of Fertility to Fertility in Parents

Lambs Parents Total Single Twin Mother single Father single 168 144 24 Father Twin 226
162 64 Father unknown 10 10 Mother Twin Father single 19 13 6 Father Twin 115 93 22
Father Unknown 17 15 2 Mother Unknown Father Single 58 40 18 Father Twin 90 56 54 Father
Unknown 191 123 68 Total 894 656 238

Note:— Tables XIII, XIV, XV & XVI combine facts in tables I, II, III, IV, pp 281–284. For fertility see table III, p 283. AGB

357

TABLE XVII: Detailed table compiled from Dr.Bell's card-catalogue of sheep born on Beinn Bhreagh 1890–1909

Total 894 wm 2n Bm 2n wm 2n s 64 Bm 2n s 1 w 759 wm 2n tw 21 Bm 2n tw B 135 wm 3n Bm
3n wm 3n s 11 Bm 3n s 1 w wm 3n tw 7 Bm 3n tw wm 404 wm 4n Bm 4n wf 355 wm 4n s 160
Bm 4n s 24 B wm 4n tw 55 Bm 4n tw 12 Bm 56 wm 5n Bm 5n Bf 79 wm 5n s 32 Bm 5n s 4 wm
5n tw 10 Bm 5n tw 5 wm wm 6n Bm 6n wm 2n 85 wm 6n s 32 Bm 6n s 7 wm 3n 18 wm 6n tw 9
Bm 6n tw 1 wm 4n 215 wm 7n Bm 7n wm 5n 42 wm 7n s 2 Bm 7n s 1 wm 6n 41 wm 7n tw Bm
7n tw wm 7n 2 wm 8n Bm 8n wm 8n 1 wm 8n s Bm 8n s wf wm 8n tw 1 Bm 8n tw wf 2n 75 wf 3n
24 wf 2n Bf 2n wf 4n 198 wf 2n s 45 Bf 2n s wf 5n 34 wf 2n tw 30 Bf 2n tw 3 wf 6n 22 wf 3n Bf 3n

wf 7n 1 wf 3n s 15 Bf 2n s wf 8n 1 wf 3n tw 9 Bf 3n tw 1 Bm wf 4n Bf 4n Bm 2n 1 wf 4n s 157 Bf 4n s 30 Bm 3n 1 wf 4n tw 41 Bf 4n tw 15 Bm 4n 36 wf 5n Bf 5n Bm 5n 9 wf 5n s 29 Bf 5n s 14 Bm 6n 8 wf 5n tw 5 Bf 5n tw 3 Bm 7n 1 wf 6n Bf 6n Bm 8n wf 6n s 18 Bf 6n s 7 Bf wf 6n tw 4 Bf 6n tw 6 Bf 2n 3 wf 7n Bf 7n Bf 3n 1 wf 7n s 1 Bf 7n s Bf 4n 45 wf 7n tw Bf 7n tw Bf 5n 17 wf 8n Bf 8n Bf 6n 13 wf 8n s 1 Bf 8n s Bf 7n wf 8n tw Bf 8n tw Bf 8n

Note :— If there are any differences between the figures given in the former tables and the figures given here, this table is the more correct. AGB

358

LIST OF LAMBS BORN ON BB 1904 .

Lamb Mother Father 1401 wm 4s May 6 6 2 604 wf 4s Mar 7 3 2 1224 wm 6s Mar 7 3 3 1402 Bm 4s May 5 5 2 606 wf 4s Mar 11 3 2 1224 wm 6s Mar 7 3 3 1403 wf 3s May 6 8 2 622 wf 4s Mar 9 5 2 1226 wm 6s Mar 7 7 3 1404 wm 5s May 8 8 2 629 wf 4x 1224 wm 6s Mar 7 3 3 1405 wm 6s Jne 10 8 2 630 Bf 4x 1224 wm 6n Mar 7 3 3 1406 wf 2s Mar 7 7 5 711 wf 4t Mar 8 5 1 907 wm 6t Mar 5 3 1 1407 Bf 4s May 6 6 2 802 Bf 5s Mar 7 2 2 1224 wm 6s Mar 7 3 3 1408 Bf 5s Mar 7 6 5 811 wf 4t Mar 6 6 2 907 wm 6t Mar 5 3 1 1409 wf 4s Jne 10 6 2 857 wf 4s Mar 5 3 2 1224 wm 6s Mar 7 3 3 1410 wf 2s May 6 6 2 839 wf 4x 1224 wm 6s Mar 7 3 3 1411 wm 4s Apl 9 5 5 939 wf 4t Apl 4 6 1 987 wm 6t Mar 5 3 1 1412 Bm 4s May 9 5 2 946 wf 4x 1224 wm 6s Mar 7 3 3 1413 wm 5s May 10 5 2 946 wf 4x 1224 wm 6s Mar 7 3 3 1414 wf 4s Mar 8 4 5 1009 wf 5t Mar 7 4 1 907 wm 6t Mar 5 3 1 1415 wf 4t Apl 5 4 2 1011 wf 5s Apl 5 3 1 1221 wm 6s Mar 6 4 3 1416 wm 5t Apl 5 4 2 1011 wf 5s Apl 5 3 1 1221 wm 6s Mar 6 4 3 1417 wm 4s Jne 4 5 1019 Bf 5s Mar 5 7 2 907 wm 6t Mar 5 3 1 1418 Bm 4s May ? 4 2 1025 wf 4s Mar 7 8 2 1224 wm 6s Mar 7 3 3 1419 Bf 4s May 6 4 2 1027 Bf 4s Mar 6 5 2 1224 wm 6s Mar 7 3 3 1420 wm 5s Apl 5 4 2 1032 wf 5s Mar 7 4 1 1221 wm 6s Mar 6 4 3 1421 wf 3s May 7 4 2 1035 wf 4s Mar 6 5 2 1224 wm 6s Mar 7 3 3 1422 wm 4s Apl 9 4 5 1042 Bf 4t Mar 6 6 2 907 wm 6t Mar 5 3 1 1423 wf 6s May 8 4 5 1046 wf 4x 907 wm 6t Mar 6 3 1 1424 wf 4t Apl 7 4 6 1050 Bf 4t 907 wm 6t Mar 5 3 1 1425 wf 3t Apl 6 4 5 1030 Bf 4t 907 wm 6t Mar 5 3 1 1426 wf 5s Apl 6 3 2 1101 wf 4s Mar 5 2 1221 wm 6s Mar 6 4 3 1427 Bm 4s Mar 9 3 2 1102 wf 4s Mar 8 5 2 1221 wm 6s Mar 6 4 3 1428 wm 5s Mar 5 2 2 1204 wf 4s Mar 8 6 3 1221 wm 6s Mar 6 4 3 1429 Bf 4s Mar 7 2 2 1208 wf 5s Apl 7 7 3 1221 wm 6s Mar 6 4 3 1430 Bm 4s Mar 7 2 2 1211 wf 6s Mar 5 4 3 1221 wm 6s Mar 6 4 3 1431 Bf 4s Mar 6 2 2 1223 wf 4s Mar 5 3 3 1221 wm 6s Mar 6 4 3 1432 wf 5s Mar 6 2 2 1228 wf 4s Mar 7 4 3 1221 wm 6s Mar 6 4 3 1433 wm 6s Mar 7 2 2 1238 wf 4s Mar 6 5 3 1221 wm 6s Mar 6 4 3 1434 wm 4s Mar 4 2 5 1240 wf 5t Mar 5 3 907 wm 6t Mar 5 3 1 1435 wf 5s Feb 3 2 DorA wf 4x 1221 wm 6s Mar 6 4 3 1436 Bf 4s May 6 2 M Bf 4x 1226 wm 6s Mar 7 7 3 1437 wm 2s May 9 2 O wf 4x 1226 wm 6s Mar 7 7 3 1438 wm 2s May 8 2 P wf 4x 1226 wm 6s Mar 7 7 3 1439 wf 2s Apl 9 5 DorD wf 2x 907 wm 6t Mar 5 3 1 1440 wm 5s May 5 DorE wf 2x 907 wm 6t Mar 5 3 1 1441 wf 4s Apl 10 5 DorF wf 2x 907 wm 6t Mar 5 3 1 1442 wm 4s Apl 10 5 DorG wf 2x 907 wm 6t Mar 5 3 1 1443 wm 2s Jan 8 DorX wf 2x 1444 wm 2s Apl 10 5 DorJ wf 2x 907 wm 6t Mar 5 3 1

1445 wm 2s Apl 9 5 DorK wf 2x 907 wm 6t Mar 5 3 1 1446 wf 4s May 8 5 wf 4x 907 wm 6t Mar 6 3 1 1447 wm 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1448 wm 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 359 1449 wf 4s May 7 5 wf 2x 907 wm 6t Mar 5 3 1 1450 wm 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1451 wm 4s May 5 wf 2x 907 wm 6t Mar 5 3 1 1452 wm 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1453 wm 4s May 5 wf 2x 907 wm 6t Mar 5 3 1 1454 wf 4s May 7 5 wf 2x 907 wm 6t Mar 5 3 1 1455 wm 4s May 5 wf 2x 907 wm 6t Mar 5 3 1 1456 wf 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1457 wf 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1458 wf 2s May 5 wf 2x 907 wm 6t Mar 5 3 1 1459 wm 4s May 5 wf 2x 907 wm 6t Mar 5 3 1 1460 wm 2t Jne 8 5 wf 2x 907 wm 6t Mar 5 3 1 1461 wf 4t Jne 8 5 wf 2x 907 wm 6t Mar 5 3 1 1462 wf 4t Jne 8 5 wf 2x 360

LIST OF LAMBS BORN ON BB 1905

Lamb Mother Father 1501 wm 4t Jan 8 DorB wf 4t wm 6x 1502 wm 5t Jan 5 DorB wf 4t wm 6x 1503 wm 5s Mar 7 5 3 1032 wf 5s Mar 7 4 1 1221 wm 6s Mar 6 4 3 1504 wf 6s Mar 3 3 3 1250 wf 6s Mar 2 3 1221 wm 6s Mar 6 4 3 1505 Bf 6s Mar 9 6 3 940 Bf 6s Apl 8 7 1 1221 wm 6s Mar 6 4 3 1506 Bf 4s Mar 9 3 3 1208 wf 5s Apl 7 7 3 1221 wm 6s Mar 6 4 5 1507 wm 5s Mar 11 3 3 1211 wf 6s Mar 5 4 3 1224 wm 6s Mar 7 3 3 1508 wm 6s Mar 7 2 3 132? wf 6s May 6 6 4 1224 wm 6s Mar 7 3 3 1509 wf 4s Mar 7 5 6 1042 Bf 4t Mar 5 5 2 907 wm 6t Mar 5 3 1 1510 wf 5s Mar 6 2 3 1344 wf 4t Apl 5 7 4 1224 wm 6s Mar 7 3 3 1511 wm 4s Mar 4 3 6 1241 wf 4t Mar 6 5 3 907 wm 6t Mar 5 3 1 1512 wm 4s Mar 10 3 3 1223 wf 4s Mar 7 4 3 1224 wm 6s Mar 7 3 3 1513 wm 4s Mar 4 2 3 1303 wf 4s Mar 6 7 1 1224 wm 6s Mar 7 3 3 1514 Bm 6s Mar 4 2 3 1333 Bf 6s Mar 8 5 1 1224 wm 6s Mar 7 3 3 1515 wm 4t Mar 6 4 3 1130 wf 4n Mar 7 5 2 1224 wm 6s Mar 7 3 3 1516 wf 5t Mar 6 4 3 1130 wf 4s Mar 7 5 2 1224 wm 6s Mar 7 3 3 1517 wm 4s Mar 5 3 3 1240 wf 5t Mar 5 3 1224 wm 6s Mar 7 3 3 1518 wf 5s Feb 4 2 2 1318 Bf 4s Mar 7 3 1 1337 wm 6s Mar 7 8 1 1519 wm 4s Mar 3 1 2 1429 Bf 4s Mar 7 2 2 1337 wm 6s Mar 7 8 1 1520 wm 4t Mar 8 3 DorA wf 4x 1224 wm 6s Mar 7 3 3 1521 wf 4t Mar 9 3 DorA wf 4x 1224 wm 6s Mar 7 3 3 1522 wm 4s Mar ? 3 3 1204 wf 4s Mar 8 6 3 1224 wm 6s Mar 7 3 3 1523 wf 4s Mar 6 2 3 1339 wf 4s Mar 8 3 1 1224 wm 6s Mar 7 3 3 1524 wf 6s Mar 7 2 3 1316 wf 4s Mar 4 6 4 1224 wm 6s Mar 7 3 3 1525 wm 6s Mar 8 5 3 1011 wf 5s Apl 5 3 1 1224 wm 6s Mar 7 3 3 1526 wm 5s Mar 9 4 2 1101 wf 4s Mar 8 5 2 1337 wm 6s Mar 7 8 1 1527 wm 4s Mar 5 5 2 1025 wf 5s May 9 7 2 1337 wm 6s Mar 7 8 1 1528 wm 5s Mar 7 2 2 1301 wf 6s Apl 6 7 4 1337 wm 6s Mar 7 8 1 1529 wf 6s Apl 8 5 2 1045 Bf 5s Apl 5 3 1 1337 wm 6s Mar 7 8 1 1530 wm 6s Apl 4 2 2 1338 wf 4s Apl 5 4 1 1337 wm 6s Mar 7 8 1 1531 wf 5s May 4 1 2 1432 wf 5s Mar 6 2 2 1337 wm 6s Mar 7 8 1 361

LIST OF LAMBS BORN ON BB 1906 .

Lamb Mother Father 1601 wm 5s Feb 2 1 3 1529 wf 6s Apl 8 5 2 1337 wm 6s Mar 7 8 1 1602 wm 4t Feb 9 3 DorB wf 4t 1337 wm 6s Mar 7 8 1 1603 wm 4t Feb 7 3 DorB wf 4t 1337 wm 6s Mar 7 8 1 1604 wm 5s Feb 6 4 4 1240 wf 5t Mar 5 3 1221 wm 6s Mar 6 4 3 1605 wm 5s Mar 6 3 1 1344 wf 4t Apl 5 7 4 1502 wm 5t Jan 8 1606 wf 6t Mar 4 1 3 1505 Bf 6s Mar 9 6 3 1337 wm

6s Mar 7 8 1 1607 wf 6t Mar 4 1 3 1505 Bf 6s Mar 9 6 3 1337 wm 6s Mar 7 8 1 1608 wf 3ty Mar 6 3 DorA wf 4x 1337 wm 6s Mar 7 8 1 1609 wf 4ty Mar 6 3 DorA wf 4x 1337 wm 6s Mar 7 8 1 1610 wm 3ty Mar 6 3 DorA wf 4x 1337 wm 6s Mar 7 8 1 1611 wf 4s Mar 7 4 1 1241 wf 4t Mar 6 5 3 1502 wm 6t Jan 8 1612 Bm 4s Mar 7 6 1 1042 Bf 4t Mar 5 5 2 1502 wm 6t Jan 8 1613 wf 4s Mar 8 4 4 1208 wf 5s Apl 7 7 3 1221 wm 6s Mar 6 4 3 1614 wm 6s Mar 7 3 3 1333 Bf 6s Mar 8 5 1 1337 wm 6s Mar 7 8 1 1615 wf 4s Mar 8 6 4 1032 wf 5s Mar 7 4 1 1221 wm 6s Mar 6 4 3 1616 wf 3s Mar 6 7 1 945 wf 4x 1502 wm 5t Jan 8 1617 Bm 5t Mar 6 6 4 1011 wf 5s Apl 5 3 1 1221 wm 6s Mar 6 4 3 1618 Bm 6t Mar 6 6 4 1011 wf 5s Apl 5 3 1 1221 wm 6s Mar 6 4 3 1619 wf 4s Mar 5 2 4 1421 wf 5s May 7 4 2 1221 wm 6s Mar 6 4 3 1620 wf 4s Mar 7 5 1 1101 wf 4s Mar 8 5 2 1502 wm 5t Jan 8 1621 Bm 4s Mar 8 3 1 1316 wf 4t Mar 4 6 4 1502 wm 5t Jan 8 1622 wf 5s Mar 7 2 5 1423 wf 6s May 8 4 5 1337 wm 6s Mar 7 8 1 1623 Bf 4s Mar 4 3 1 1303 wf 4s Mar 8 7 1 1503 wm 5t Jan 8 1624 Bm 4s Mar 8 6 1 602 Bf 5s Mar 7 2 2 1502 wm 5t Jan 8 1625 wf 6s Mar 8 4 3 1211 wf 6s Mar 5 4 3 1337 wm 6s Mar 7 8 1 1626 wm 4s Mar 7 4 1 1228 wf 4s Mar 7 4 3 1502 wm 5t Jan 8 1627 wm 4s Mar 8 3 1 1339 wf 4s Mar 8 5 1 1502 wm 6t Jan 8 1628 wm 4s Mar 7 4 1 1204 wf 4s Mar 6 6 3 1502 wm 5t Jan 8 1629 wm 6s Mar 3 1 3 1624 wf 6s Mar 7 2 3 1357 wm 6s Mar 7 8 1 1630 wm 5t Mar 8 4 3 1250 wf 6s Mar 2 3 1337 wm 6s Mar 7 8 1 1631 wf 4t Mar 7 4 3 1250 wf 6s Mar 2 3 1337 wm 6s Mar 7 8 1 1632 Bf 5s Mar 8 7 1 960 Bf 6s Apl 8 7 1 1502 wm 5t Jan 8 1633 wf 5s Mar 9 5 1 1130 wf 4s Mar 7 5 2 1502 wm 5t Jan 8 1634 Bm 3s Apl 8 6 1019 Bf 5s Mar 5 7 2 1635 wm 3s Apl 12 6 4 1023 wf 5s May 9 7 2 1221 wm 6s Mar 6 4 3 1636 wf 6s Apl 9 3 3 1326 wf 6s May 6 6 4 1337 wm 6s Mar 7 8 1 1637 wm 6s May 8 2 4 1432 wf 5s Mar 6 2 2 1221 wm 6s Mar 6 4 3 1638 wm 4s Dec 9 3 DorB wf 4t 1337 wm 6s Mar 7 8 1 362

LIST OF LAMBS BORN ON BB 1907 .

Lamb Mother Father 1701 wf 6s Feb 6 2 4 1529 wf 6s Apl 5 5 2 1337 wm 6s Mar 7 8 1 1702 wf 4s Feb 8 5 2 1240 wf 5t Mar 5 3 1502 wm 5t Jan 8 1703 wf 4s Feb 7 7 2 1032 wf 5s Mar 7 4 1 1502 wm 5t Jan 8 1704 wm 4s Feb 7 4 2 1339 wf 4s Mar 8 5 1 1502 wm 5t Jan 8 1705 wm 4s Feb 12 5 4 1250 wf 6s Mar 2 3 1337 wm 6s Mar 7 8 1 1706 Bf 6s Mar 7 7 1 1019 Bf 5s Mar 8 7 2 1618 Bm 6t Mar 6 6 4 1707 Bm 4s Mar 9 4 2 1316 wf 4t Mar 4 6 4 1502 wm 5t Jan 8 1708 wm 5s Mar 8 3 2 1421 wf 5s May 7 4 2 1502 wm 5t Jan 8 1709 Bf 4s Mar 9 5 2 1206 wf 5s Apl 7 7 3 1502 wm 5t Jan 8 1710 Bm 4s Mar 7 7 1 1042 Bf 4t Mar 5 5 2 1618 Bm 6t Mar 6 6 4 1711 wm 5t Mar 6 7 2 1011 wf 5s Apl 5 3 1 1502 wm 5t Jan 8 1712 Bm 4t Mar 6 7 2 1011 wf 5s Apl 5 3 1 1502 wm 5t Jan 8 1713 wm 4s Mar 7 3 2 1424 wf 4t Apl 7 4 5 1502 wm 5t Jan 8 1714 Bf 5s Mar 7 2 1 1505 Bf 6s Mar 9 6 3 1618 Bm 6t Mar 6 6 4 1713 wf 4s Mar 9 5 2 1223 wf 4s Mar 7 4 3 1502 wm 5t Jan 8 1716 wf 5s Mar 9 5 2 1204 wf 4s Mar 8 6 3 1502 wm 5t Jan 8 1717 wf 4s Mar 6 2 2 1516 wf 5t Mar 6 4 3 1502 wm 5t Jan 8 1718 wf 4s Mar 9 6 2 1101 wf 4s Mar 8 5 2 1502 wm 5t Jan 8 1719 wf 4s Mar 4 4 2 1303 wf 4s Mar 8 7 1 1502 wm 5t Jan 8 1720 Bf 4s Mar 9 4 1 1333 Bf 6s Mar 8 5 1 1618 Bm 6t Mar 6 6 4 1721 wf 4s Mar 9 3 2 1432 wf 5s Mar 6 2 2 1502 wm 5t Jan 8 1722 wm 7s Mar 6 1 1 1611 wf 4s Mar 7 4 1 1614 wm 6s Mar 7 3 3 1723 wm 5s Mar

8 3 4 1423 wf 6s May 8 4 5 1337 wm 6s Mar 7 8 1 1724 wm 6s Mar 9 5 4 1211 wf 6s Mar 5 4 3
1337 wm 6s Mar 7 8 1 1725 Bf 6t Mar 6 8 1 940 Bf 6s Apl 8 7 1 1618 Bm 6t Mar 6 6 4 1726 Bf 4t
Mar 6 8 1 940 Bf 6s Apl 8 7 1 1618 Bm 6t Mar 6 6 4 1727 wm 4s Mar 15 7 2 1025 wf 5s May 9 7
2 1502 wm 5t Jan 8 1728 wm 6s Mar 5 2 4 1521 wf 4t Mar 9 3 1337 wm 6s Mar 7 8 1 1729 Bm
5s Mar 8 1 1 1632 wf 5s Mar 8 7 1 1618 Bm 6t Mar 6 6 4 1730 wm 6s Apl 4 1 1 1622 wf 5s Mar
7 2 3 1614 wm 6s Mar 7 3 3 1731 wm 6s Apl 4 1 1 1606 wf 6t Mar 4 1 3 1614 wm 6s Mar 7 3 3
1732 wm 6s Apl 4 1 1 1620 wf 4s Mar 7 5 1 1614 wm 6s Mar 7 3 3 1733 wf 5s Apl 4 1 1 1607 wf
6t Mar 4 1 3 1614 wm 6s Mar 7 3 3 1734 wf 7s May 7 4 4 1326 wf 6s May 6 6 4 1337 wm 6s Mar
7 8 1 1735 wm 4t Jly 6 1 DorB wf 4t 1614 wm 6s Mar 7 3 3 1736 wf 3t Jly 4 1 DorB wf 4t 1614
wm 6s Mar 7 3 3 363

LIST OF LAMBS BORN ON BB 1908 .

Lamb Mother Father 1801 wf 5s Feb 6 9 3 940 Bf 6s Apl 6 7 1 1502 wm 5t Jan 8 1802 Bf 4s
Feb 6 2 2 1623 Bf 4s Mar 4 3 1 1618 Bm 6t Mar 6 6 4 1803 Bm 5s Mar 5 8 1019 Bf 5s Mar 6 7 2
1804 wm 6t Mar 6 6 5 1250 wf 6s Mar 2 3 1337 wm 6s Mar 7 8 1 1805 wf 6t Mar 6 6 5 1250 wf
6s Mar 2 3 1337 wm 6s Mar 7 8 1 1806 wf 4t Mar 7 5 DorB wf 4t 1337 wm 6s Mar 7 8 1 1807 wf
2t Mar 6 5 DorB wf 4t 1337 wm 6s Mar 7 8 1 1808 wf 4s Mar 6 5 1702 wf 4s Feb 8 5 2 1337 wm
6s Mar 7 8 1 1809 wf 4s Mar 7 3 3 1529 wf 6s Apl 8 5 2 1502 wm 5t Jan 6 1810 wm 5s Mar 7 3 3
1505 Bf 6s Mar 9 6 3 1502 wm 5t Jan 8 1811 wm 4t Mar 5 5 3 1339 wf 4s Mar 8 5 1 1502 wm 5t
Jan 8 1812 wm 4t Mar 5 5 3 1339 wf 4s Mar 8 5 1 1502 wm 5t Jan 8 1813 wf 6s Mar 6 1 5 1709
Bf 4s Mar 9 5 2 1337 wm 6s Mar 7 8 1 1814 wm 6s Mar 6 2 5 1620 wf 4s Mar 7 5 1 1337 wm 6s
Mar 7 8 1 1815 wf 4t Mar 6 4 3 1424 wf 4t Apl 7 4 5 1502 wm 5t Jan 6 1816 wf 4t Mar 5 4 3 1424
wf 4t Apl 7 4 5 1502 wm 5t Jan 8 1817 Bf 4s Mar 5 5 3 1333 Bf 6s Mar 6 5 1 1502 wm 5t Jan 8
1818 wm 4s Mar 6 1 5 1718 wf 4s Mar 9 6 2 1337 wm 6s Mar 7 8 1 1819 wf 4t Mar 5 6 3 1228
wf 4s Mar 7 4 3 1502 wm 5t Jan 8 1820 wf 5t Mar 5 6 3 1228 wf 4s Mar 7 4 3 1502 wm 5t Jan 8
1821 wm 6t Mar 6 8 3 1011 wf 5s Apl 5 3 1 1502 wm 5t Jan 8 1822 wf 4t Mar 3 8 3 1011 wf 5s
Apl 5 3 1 1502 wm 5t Jan 8 1823 wf 4s Mar 7 7 3 1101 wf 4s Mar 8 5 2 1502 wm 5t Jan 8 1824
Bm 7s Mar 7 5 3 1326 wf 6s May 6 6 4 1502 wm 5t Jan 8 1825 wf 6s Mar 7 3 3 1516 wf 5t Mar 6
4 3 1502 wm 5t Jan 8 1826 wf 4s Mar 7 4 3 1432 wf 5s Mar 6 2 2 1502 wm 6t Jan 8 1827 Bf 4s
Apl 6 2 1 1606 wf 6t Mar 4 1 3 17A wm 6t 1828 wm 4s Apl 6 1 2 1721 wf 4s Mar 9 3 2 1637 wm
6s May 8 2 4 1829 wf 4s May 7 1 1 1703 wf 4s Feb 7 7 2 17A wm 6t 1830 wf 4s May 3 1 2 1706
Bf 6s Mar 7 7 1 1637 wm 6s May 8 2 4 1831 wf 5s May 5 1 1 17B wf 6t 17A wm 6t 1832 Bf 4s
May 4 1 1 1726 Bf 4t Mar 6 8 1 17A wm 6t 1833 wf 4s May 5 1 1 1715 wf 4s Mar 9 5 2 17A wm
6t 1834 wm 6s May 7 2 1 1622 wf 5s Mar 7 2 3 17A wm 6t 1835 wf 6s May 5 1 1 1716 wf 5s Mar
9 5 2 17A wm 6t 1836 wf 6s May 7 2 1 1607 wf 6t Mar 4 1 3 17A wm 6t 1837 wm 5s May 5 1 1
1714 Bf 5s Mar 7 2 1 17A wm 6t 364

LIST OF LAMBS BORN ON BB 1909 .

Lamb Mother Father 1901 wf 6s Mar 6 3 6 1620 wf 4s Mar 7 5 1 1337 wm 6s Mar 7 8 1 1902 wf 4s Mar 7 3 6 1623 Bf 4s Mar 4 3 1 1337 wm 6s Mar 7 8 1 1903 wm 6s Mar 9 5 1 1424 wf 4t Apl 7 4 5 1521 wm 6t Mar 6 8 3 1904 wf 2s Mar 9 1 2 1815 wf 4t Mar 6 4 3 17A wm 6t 1905 wm 5t Mar 6 4 1 1516 wf 5t Mar 6 4 3 1821 wm 6t Mar 6 8 3 1906 wm 4t Mar 5 4 1 1516 wf 5t Mar 6 4 3 1821 wm 6t Mar 6 8 3 1907 wf 4t Mar 5 2 6 1715 wf 4s Mar 9 5 2 1337 wm 6s Mar 7 8 1 1908 wm 5t Mar 5 2 6 1715 wf 4s Mar 9 5 2 1337 wm 6s Mar 7 8 1 1909 wm 4s Mar 6 1 6 1809 wf 4s Mar 7 3 3 1337 wm 6s Mar 7 8 1 1910 wm 5s Mar 8 2 6 1709 Bf 4s Mar 9 5 2 1337 wm 6s Mar 7 8 1 1911 wf 5s Mar 8 2 6 17B wf 6s 1337 wm 6s Mar 7 8 1 1912 wm 6t Mar 7 4 2 1505 Bf 6s Mar 9 6 3 17A wm 6t 1913 Bf 6t Mar 6 4 2 1505 Bf 6s Mar 9 6 3 17A wm 6t 1914 wm 5s Mar 6 1 6 1823 wf 4s Mar 7 7 3 1337 wm 6s Mar 7 8 1 1915 wm 4s Mar 7 2 6 1721 wf 4s Mar 9 3 2 1337 wm 6s Mar 7 8 1 1916 Bf 6t Mar 7 3 1 1606 wf 6t Mar 4 1 3 1821 wm 6t Mar 6 8 3 1917 wm 8t Mar 6 3 1 1606 wf 6t Mar 4 1 3 1821 wm 6t Mar 6 8 3 1918 wf 4s Mar 8 2 6 1703 wf 4s Feb 7 7 2 1337 wm 6s Mar 7 8 1 1919 wm 3t Mar 6 1 2 1806 wf 4t Mar 7 5 17A wm 6t 1920 wf 3t Mar 5 1 2 1806 wf 4t Mar 7 5 17A wm 6t 1921 wm 6s Mar 5 1 6 1817 Bf 4s Mar 5 5 3 1337 wm 6s Mar 7 8 1 1922 Bf 6t Mar 6 2 2 1725 Bf 6t Mar 6 8 1 17A wm 6t 1923 Bf 3t Mar 5 2 2 1725 Bf 6t Mar 6 8 1 17A wm 6t 1924 wm 4s Mar 9 1 2 1816 wf 4t Mar 5 4 3 17A wm 6t 1925 Bm 6s Mar 9 2 2 1726 Bf 4t Mar 6 8 1 17A wm 6t 1926 wf 5s Mar 7 1 6 1826 wf 4s Mar 7 4 3 1337 wm 6s Mar 7 8 1 1927 wf 4s Mar 6 1 6 1825 wf 5s Mar 7 3 3 1337 wm 6s Mar 7 8 1 1928 wm 6s Apl 10 4 2 1529 wf 6s Apl 8 5 2 17A wm 6t 1929 wm 6t Apl 6 2 1 1706 Bf 6s Mar 7 7 1 1821 wm 6t Mar 6 8 3 1930 wm 4t Apl 5 2 1 1706 Bf 6s Mar 7 7 1 1821 wm 6t Mar 6 8 3 1931 wm 6s Apl 7 1 6 1802 Bf 4s Feb 6 2 2 1337 wm 6s Mar 7 8 1 1932 wf 6s Apl 8 1 2 1813 wf 6s Mar 6 1 5 17A wm 6t 1933 wm 7s Apl 7 1 1 1808 wf 4s Mar 5 1 5 1804 wm 6t Mar 6 6 5 1934 wf 6s Apl 7 1 6 1827 Bf 4s Apl 6 2 1 1337 wm 6s Mar 7 8 1 1935 wf 5s Apl 7 2 1 1716 wf 5s Mar 9 5 2 1836 wm 6s May 7 2 1 365

1909, Oct.6 SHEEP CATALOGUE 1904-1909

Oct.6 :— In 1904 I published a Sheep Catalogue, showing the origin of the multi-nippled sheep of Beinn Bhreagh, and giving a list of the lambs born from 1890-1903 (inclusive).

In this number of the Recorder I continue the list, showing the lambs born on Beinn Bhreagh from 1904-1909 (inclusive).

Since the publication of the earlier catalogue a few errors have been discovered in the printed list, and I give the errata here for the benefit of those who possess the printed catalogue.

ERRATA

In Sheep-catalogue printed 1904

111 wf 2n s should be wf 2n tw

112 wm 2n s should be wm 2n tw

113 wm 4n tw should be wf 4n tw

940 Bf 5n s should be Bf 6n s

1023 wf 4n s should be wf 5n s

1211 wf 4n s should be wf 6n s

1238 wm 4n s should be wf 4n s

1240 wf 4n tw should be wf 5n tw

1250 wf 5n s should be wf 6n s

1314 Bf 5n s should be Bm 5n s

Where these sheep are mentioned as the mothers or fathers of lambs born 1904–1909 those errors have been corrected.

Explanation of Contractions

The nature of the contractions employed in the Sheep Catalogue of 1904–1909 will be understood from an example. 366 Take the first lamb mentioned on page 358, namely 1401.

1401 is a white male, four-nippled, single lamb, born in May, weighing 6 lbs. at birth, mother 8 years old, father 2 years old.

The mother of 1401 was 604, a white female, four-nippled, single, born in March, weighing 7 lbs. at birth. Her mother was 3 years old when she was born, and her father 2 years old.

The father of 1401 was 1224, a white male, six-nippled, single, born in March, and weighed 7 lbs. at birth. His mother was 3 years old when he was born, and his father 3 years old.

1415 wf 4t etc. was a white female, four-nippled, twin.

The mother of 1423 is 1046 wf 4x etc. That is:— 1046 was a white female, four-nippled, and it was unknown (x) whether she was a single or twin lamb.

So few triplets have appeared that it has been found un-necessary to give a special contraction for "triplet". The three cases, however, that appear in the present list are marked by the letter r after the t. Thus:— 1608 wf 3tr, 1609 wf 4tr, 1610 wm 3tr, are the three triplets born of "Dorset A", a purchased Dorset ewe.

With this explanation I think that the contractions employed in the catalogue will be intelligible to all.

AGB

367

DEPARTMENT OF BUILDINGS & .

Reservoir .

Oct 7 :— The masonry in the over-flow of the reservoir at the McNeil spring, which supplies the Lodge, Bungalow, Laboratory etc., being in a bad condition, we have replaced it with new concrete. CCB.

Fencing at Crescent Grove .

Oct 7 :— The fences around Crescent Grove house have been put in good repairs. I will now give a contract for running a line fence from the street between the Crescent Grove, and Mr. Ker's property. Alec a fence along the edge of brook which forms the rear boundary of the Crescent Grove property. CCB.

Mrs. ?r?st's Cottage .

Oct 7 :— The frame of the 1st Cottage is erected, and the floors laid. The walls are now being boarded in. CCB.

Crematory .

Oct 7 :— Had the crematory burned out yesterday; also some slight repairs made around top of chimney, where the frost touched it last Fall before the mortar had completely set. CCB.

Plans for Sheep Shed .

Oct 7 :— I expect to get plans ready for Mr. Manchester's new sheep house immediately. CCB.

368

BEINN BHREAGH FARM DEPARTMENT .

Work of Department for Week ending Oct 2 .

Oct 7 :— We have been cutting and hauling in grain; ploughing; repairing tongue of land at Beinn Bhreagh Harbor, where even the sea had succeeded in washing away the spruce bushes; cleaning out sluices and drains of Beinn Bhreagh roads, and graveling roads.

PM.

Examination of Zulu Sheep .

Oct 7 :— Dr. Bell made an examination of the Zulu Sheep on Saturday Oct 2, for the purpose of recording the number of nipples, and their position; number of horns, age and sex of each individual. Three sheep with the best nipples were selected to mate with a six-nippled ram from Beinn Bhreagh Nursery, but as these Zulu sheep have heretofore been mated specially in regards to their horns, which is one of the most attractive points of the Zulu Sheep, Dr. Bell has decided to follow this course in mating, thinking that it would be much better than to cross them with the native sheep. PM.

Three year old Colt weighs 1250 .

Oct 7: — On Monday I took the three year old colt which was raised on the Beinn Bhreagh Farm to Haddeck, and had her shed, preparatory to putting her to work. While there I also had her weighed. She weighs 1250 lbs, quite heavy for a three year old colt. PM.

369

The Zulu Ram, "Admiral Anson", and ram "Young Admiral". Photo by J. McNeil.

The three A Z ulu Rams imported from England, "Admiral Anson, The young Admiral, and ram Goat-Horns". Photo by J. McNeil.

370

The Zulu Ewes imported from England. Photo by J. McNeil.

The Zulu Ewes imported from England. Photo by J. McNeil.

371

BEINN BHREAGH NURSERY .

A Trip in the Gauldrie .

Oct 7 :— I left Beinn Bhreagh Sept 26 on board the Gauldrie in company with Mrs. Bell, Mrs. Grosvenor, Gertrude Grosvenor, Edith Davidson, and Malcolm McDonald, brother of Capt McDonald of the Gauldrie. The lake was nice and calm when leaving Beinn Bhreagh, but the wind rose and there was a little swell on the Lake before we reached Grand Narrows.

Mrs. Bell and company went to meet Miss Caroline McCurdy, who arrived by the morning train from a tour in Europe. On arrival at the Grand Narrow's Hotel, Miss McCurdy was out, and we went in search of her, and found her seated on the platform at the Station accompanied by her dog General Wolf. She was busily engaged sketching a vessel on the Bras d'Or Lake. All returned to the hotel where Miss McCurdy got ready to continue her journey with Mrs. Bell to Beinn Bhreagh in the Gauldrie. The wind by th?s time had increased and quite a sea was running, but Capt. McDonald said there was no danger only the passengers would get wet. About the time the Gauldrie had got under way on the return trip, the wind had increased in velocity. About this time I had a conversation wi

with the Capt. of the steamer "Richmond", which was lying at the Grand Narrows wharf, and he said he thought it was a pity they had left as from all appearances the wind was increasing. I then went over to the railroad truck thinking I might be able to attract their attention, and get them to turn, but as 372 I reached the track the Gauldrie had just gone through the draw and right in the worst of the sea. It would have then been unsafe for them to attempt the turn. The spray was coming right over her in clouds, but she was riding the seas well, and was well handled by Capt. McDonald. It was very fortunate his brother was with him, for had anything gone wro wrong with the engine it would have been hard for one to attend to the steering and engine both. I felt rather uneasy all the evening and tried to get Baddeck by telephone and telegraph, but with no success. All seamen around Grand Narrows said everything would be all right as the worst of the sea was at the bridge. About 6:00 P.M. a small motor boat have in sight coming down the lake, and came to the Grand Narrows wharf. I recognized it as the "Rose", and went over to the wharf and met Mr. Cox, Manchester, McLeod and Rudderham, all of whom were dripping wet. They stayed at the hotel for the night. I arranged with Mr. Cox to telegraph me at Truro when he reached Beinn Bhreagh if Gauldrie and party arrived safely. I went on to the Halifax Exhibition by the night express stopping over at Truro, and was very much pleased when I get a telegram from Mr. Cox, that the Gauldrie and passengers were safe at Beinn Bhreagh.

Visit to Provincial Farm .

Oct 7: — I went out to the Provincial Farm and College Monday at Truro, and was very much impressed with the improvements the Government has made in buildings there in the past three years; also the fine stock of cattle, horses, pigs, 373 poultry they are collecting for the benefit of Nova Scotia, and the interesting experiments they are conducting in the raising of turnips, mangles and sugar beets by the use of many artificial fertilizers, of which the farmers in general throughout Nova Scotia will get the full benefit of in the Annual Report by the Secretary of Agriculture for 1909, which our genial Premier Murray so liberally distributes.

I also visited the firm of Suckling and Chase, Truro Nursery. This firm has made rapid advances since my first visit there in the Fall of 1902, greatly increasing their glass area besides building a shop with conservatory attached. I left Truro Monday night for Halifax. At Halifax hotels were filled up to over-flow. Mr. Samuel Campbell of Baddeck was staying at the "Queens", and he kindly shared his room with me. Mr. Campbell was about to start on a tour of inspection of light houses around the SW coast. I visited the Nova Scotia Nursery and Public Gardens in Halifax; also purchased a car load of hay for sheep and goats, besides several other minor details in connection with Beinn Bhreagh Nursery.

The exhibits at the Exhibition were on an average fairly good; some departments much better than I have seen in former years; others somewhat behind. The fruit exhibit I considered very fine; flowers were behind the average; vegetables a good exhibit, but to my mind very poor judgement used in giving awards. Some very fine cattle, horses, sheep, pigs, poultry, pigeons and birds were exhibited, although 374 there seemed to be a great many vacant stalls in all classes.

Gasoline engines of all sizes and builds were a good exhibit, especially marine engines, which a few years ago were not exhibited at Halifax at all.

Horse racing was considerably handicaped this year on account of the wet weather, but a fine lot of horses were present to compete, and some very exciting heats were run in the different classes that I observed. I arrived home Friday morning (Oct 1) after enjoying a few pleasant days outing. JGD.

Work at Nursery.

Oct 7: — Work on BB Nursery for week ending Oct 2. Taking up part of potatoes; harvesting of some oats with spells at Lilly Pond; also general work as cleaning up of driveways, securing flowers, vegetables, and general care of stock. JGD.

Visitors at BB Nursery.

Oct 7: — Miss Alice McInnis, and Miss Carmichael of Big Baddeck. JGD.

375

BEINN BHREAGH LABORATORY .

Work on Full size Oionos Machine.

Sept 27 :— Started to work at ripping up the ribs for full size Oionos machine. We are going to perforate the ribs throughout with 5/16" holes for the small ones and 3/8" holes for the large ones.

Experiment shows that we will save about 500 grams in the weight of the whole machine by this move which will be enough to pay for all the shell? we will use to varnish the whole work.

We are also rounding off the corners of ribs on the insides, and will th?s save a little more in weight.

The ribs when finished will be well under the estimate of weight given on page 76 of the Recorder. WFB.

Sept 28 :—Mal ? c olm McFarlene returned to work at the Laboratory to-day very much improved in health. WFB.

Oionos Model .

Sept 29: We are at work on a change in the construction of the bow of Oionos model this being Dr. Bell's suggestion. Formerly the point of attachment of the flying-line was in line with the center of surface. As it is now this point is down midway between the center surface and the bottom surface. Also the bottom members run right under the bottom of structure, about 15 cm below the bottom surface, and extend back about 75 cm behind the back edge, and are bowed up with wire towards the center surface making a pair of 376 skids intended to prevent serious damage to the machine on coming to the ground. WFB.

Experiments with Query .

Oct 1 :— Experiments were made to-day with Query without hydro-surfaces. 12 experiments were made with motor boat "Sw?rm". The speed readings were for 100 meters. 19 experiments were made with motor boat "Piper". Pull was steady in all of these experiments. WFB.

Weight of Oionos Model .

Oct 2 :— Revised weight of Oionos model with new bow is as follows:—

Bow (including lead 300 grams) 4060 gms.

Tail 2373 gms.

Body 19?50 gms.

Total 25.483 kg

WFB.

Oionos Model on Bay .

Oct 2: — Took Oionos model on the bay to-day on board the "Get-Away" towed by the Gauldrie. Wind about 20 km per hr. With the Gauldrie going full speed against the light air observed. Did not attempt to raise the kite into the air, but simply held it up to take "the feel of it" in the air. It lightened perceptibly and there was no jerky tugging motion, so we presume that she will fly properly when released on a long line. Did not desire to risk injuring her before getting a series of observations to test her efficiency as a kite. Will wait for a white-cap breeze before making further observations. AGB.

377

Experiments with Query.

Oct. 5: — The Query was towed this morning over the two mile motor boat course used by the yacht club from Carruth's wharf to Baddeck. It is marked every quarter of a mile by fixed points on the land. Towed by the Piper. No hydro-surfaces were employed, but the weight of the hydro-surfaces (namely 50 lbs) was put on board. There were no men on board and the Query was towed empty. AGB

OIONOS MODEL.

Oct. 7: — Oionos model was tried on Bay to-day. A good white-cap wind was blowing. Balance was just a little head-heavy. The kite was put on board the "Get-Away" and towed by the Gauldrie out to the Bay against the wind, which was found to be about 37.25 km per hr. Tried "the feel of it" with a piece of line about a meter long on the "Get-Away". She seemed very steady. No longitudinal oscillation. Then went on board the Gauldrie and let her out and tried her.

She rose well, but immediately started to sway violently from side to side. She was perfectly steady in the fore and aft direction. She was so uneasy that we could not get her to obtain readings. We tried for a long time to get her on to 100 m of line, but failed to do it. So, as a last resort, I attached the scale on line at the 90 m mark and held it in my hand so as to get an idea of the pull. The scale

fluctuated from 4 to 40 kg. The angle could not be read at all, as I could not leave line long enough to get 378 instrument but should say that the angle was about 13 to 20°.

During one of the sways the kite get so low that she would not recover herself and dropped into the water. We picked her up on the "Get-Away". Some little damage was done in the water. The tail is completely broken. The nose and attachments stood up very well, not a thing being broken. Some ribs are broken in the two upper surfaces.

During the long swaying movements of the kite, the flying lines were swaying violently, which perhaps might account for the kite not ultimately steadying herself. She would travel sideways for about 50 m, then come back suddenly giving an awful sway to the ropes. The ropes would get into the water, and so would swing back and come right up short. Wind all through seemed to be very steady. WFB.

Experiments with Model of Cygnet II .

Oct 7 :— The Cygnet model was flown on the Bay this afternoon under conditions r 125 c 200. Twenty full sets of readings were obtained. Attachment was then changed to r 150 c 200. Three full sets of readings were obtained with very low angles of flight, after which the kite took a sudden dive to one side during a gust, and being so near the surface, touched the water and was smashed. This kite has done good service in giving us valuable data, and its destruction is not a serious loss, as we have another duplicate kite which has been reserved for the emergency which has arisen. Experiments will be continued with the duplicate kite at favorable opportunities. I am inclined to think that the dangling bow-line may have been responsible for the swaying 379 movements observed to-day in the high wind.

Attachment of flying-line was very far forward, 150 cm in front of center of kite, and the altitude so low that the slack line often touched the water. The pressure of the wind on this bow-line would tend to steer the kite off the wind, now to one side, and then to another. AGB.

380

1909, Oct 6, KITE DATA SEPT 23–OCT 5

Secured with Model of Cygnet II.

Conditions	Observations	Date	Exp.	FL	BL	Wind	Pull	Altitude
Sept 23 1	r50 c200	25.40 km	69.8 kg	39°.9	Sept 23 2	r50 c200	22.50 km	73.2 kg
41°.4	Sept 23 3	r50 c200	26.00 km	72.0 kg	40°.5			

Sept 23 4 r50 c200 28.80 km 68.0 kg 39°.4 Sept 23 5 r50 c200 28.00 km 57.2 kg 38°.6 Sept 23 6 r50 c200 27.50 km 62.4 kg 39°.6 Sept 23 7 r50 c200 29.00 km 74.4 kg 40°.2 Sept 23 8 r50 c200 30.70 km 74.8 kg 40°.5 Sept 23 9 r50 c200 29.70 km 74.8 kg 39°.7 Sept 23 10 r50 c200 25.00 km 70.0 kg 39°.1 Sept 23 11 r50 c200 28.60 km 73.6 kg 39°.5 Sept 23 12 r50 c200 25.40 km 70.8 kg 42°.9 Sept 23 13 r50 c200 26.50 km 64.0 kg 39°.7 Sept 23 14 r50 c200 27.40 km 62.0 kg 39°.0 Sept 23 15 r50 c200 25.00 km 61.8 kg 39°.3 Sept 23 16 r50 c200 25.00 km 58.8 kg 39°.3 Sept 23 17 r50 c200 23.40 km 66.0 kg 40°.1 Sept 23 18 r50 c200 24.70 km 73.6 kg 40°.6 Sept 23 19 r50 c200 26.00 km 78.4 kg 40°.7 Sept 23 20 r50 c200 25.80 km 77.2 kg 40°.8 Oct 5 1 r75 c200 24.40 km 22.6 kg 13°.3 Oct 5 2 r75 c200 25.65 km 29.4 kg 20°.4 Oct 5 3 r75 c200 26.00 km 27.0 kg 21°.2 Oct 5 4 r75 c200 26.40 km 25.8 kg 19°.1 Oct 5 5 r75 c200 28.00 km 27.8 kg 21°.6 Oct 5 6 r75 c200 27.80 km 27.2 kg 22°.9 Oct 5 7 r75 c200 27.00 km 28.4 kg 24°.2 Oct 5 8 r75 c200 28.00 km 26.4 kg 23°.0 Oct 5 9 r75 c200 30.00 km 26.4 kg 24°.6 Oct 5 10 r75 c200 27.40 km 27.2 kg 23°.1 Oct 5 11 r75 c200 28.00 km 28.8 kg 21°.7 Oct 5 12 r75 c200 28.65 km 34.4 kg 25°.0 Oct 5 13 r75 c200 29.65 km 32.0 kg 24°.5 Oct 5 14 r75 c200 27.00 km 27.6 kg 21°.7 Oct 5 15 r75 c200 24.00 km 26.6 kg 21°.7 Oct 5 16 r75 c200 27.40 km 34.8 kg 25°.3 Oct 5 17 r75 c200 25.20 km 26.0 kg 22°.9 Oct 5 18 r75 c200 25.45 km 23.6 kg 22°.9 Oct 5 19 r75 c200 30.20 km 29.6 kg 24°.1 Oct 5 20 r75 c200 23.00 km 25.2 kg 22°.6

Bedwin's Notes :— Sept 23 flying-line r +50, bow-line c +200. Everything went fairly well, though the wind was a little unsteady and about W by N. WFB.

381

1909, Oct. 7

1909 OCT 2 Model of Oionos Drome showing the new bow. Photo by J. McNeil.

1909 OCT 2 Model of Oionos Drome showing the new bow. Photo by J. McNeil.

382

1909, Oct 9,

The Oionos model on the deck of the "Get-Away. Photo by J. McNeil.

Oionos model in the air. Photo by J. McNeil.

383

The Oionos model tipped on one side. Photo by J. McNeil.

Oionos model falling into the water. Photo by J. McNeil.

384

1909, Oct 8, CANADIAN AERODROME COMPANY .

Sept 29 :—Met Mr. McRae in town to-night, and he reports that Messrs. Baldwin and McCurdy expect to make a few short flights with Baddeck No.II at the Bentick Farm tomorrow afternoon. He also reports Mr. Bell reached the testing grounds about 7 o'clock.

CRC.

Work at Factory .

Sept 29 :—The men employed at the Canadian Aerodrome factory on Beinn Bhreagh are now putting together Baddeck No I, and are also making separate pa t? for Baddeck No. II, which might be used in case of accident.

McC.

Sept 29 :— Baldwin and McCurdy after spending a few hours at the factory this afternoon left for Big Baddeck. They expect to give Baddeck No.II a trial to-morrow.

CRC

Flights with Baddeck No II .

Sept 30 :—Willie McDonald and McRae came in to town to-night, and report that Baddeck No.II was successfully put into the air this afternoon. They report a little damage was done to the machine in making landings as the ground is very rough, and jars the machine. CRC.

Oct 3 :—The Gauldrie made a trip to Big Baddeck to-day bringing out radiator which was repaired at the factory. Mr. and Mrs. Baldwin, Miss Darling and Mr. McCurdy returned to Beinn Bhreagh in the Gauldrie this afternoon. CRC.

385

Dr. Bell's Trip to the Testing Grounds .

Sept 29: — Reached the testing grounds at the Bentick Farm, Big Baddeck just at dusk. Dave Dunlop drove me from Baddeck. Found Mrs. Bell, Miss Caroline McCurdy, Mrs. Baldwin, Miss Darling, Melville and Gertrude Grosvenor hers; also Mr. Baldwin, Mr. McCurdy, Mr. Gardiner Hubbard, and John McDermid.

Baddeck 2 leaves ground Sept 29.

A trial flight with Baddeck 2 was made, but it was too dark for me to note the result. Mr. Baldwin was on board and I understand from him that the machine was off the ground, but flying low to the place where he landed.

Mrs. Bell, Miss McCurdy (with her little dog Gen. Wolf) and Melville and Gertrude Grosvenor drove back to Baddeck with John McDermid.

Mrs. Baldwin, and Miss Darling occupy a tent beside the barn. Mr. Baldwin, Mr. McCurdy, and Mr. Gardiner Hubbard have another tent, but prefer to sleep in the hay in the barn.

My new house-boat is very comfortable, and I anticipate great pleasure in camping out in her. This is the old "Ugly Duckling", converted into a glass-bottomed house-boat.

First Flight Sept 30 .

Sept 30 : I have brought my card catalogue with me here (Bentick Farm) so as to utilize my spare time by 386 compiling sheep statistics.

At 3:45 P.M. the buzz of a rotating propeller interrupted my work; and I looked out from the house-boat and saw Baddeck No II just starting towards the distant end of the field. I did not see who was in her. As her distance increased I could not tell whether she left the ground or not.

Leaving the house-boat, I took my station on the field, near the line of flight, and about half way between the starting point and the barn.

Second Flight Sept 30 .

At the distant end of the field the Drome was turned round facing the barn, and started again towards me with Douglas McCurdy as aviator. The machine left the ground two or three times, making short jumps of only a few yards at a time. I don't think she cleared the ground by more than a foot or two. Then the engine was shut off, and the Drome landed gently on the grass not far from the point where I had stationed myself.

The machine was shoved back to the distant end of the field by several men. The difficulty they had in moving her shows that great power must be exerted by the engine to move her at all on this ground; and it might be well to consider the advisability of having a specially smoothed place to start from. The engine must indeed be a good one, and the propeller very efficient, to enable the machine to gain 387 lifting speed on rough ground.

Third Flight Sent 30 .

A third attempt was made, starting from the distant end of the field, with Baldwin as aviator.

This time there was no doubt of her lifting. The machine, I should judge, was about ten feet clear of the ground when she passed me; and made a flight of, I should say, about half a mile or more altogether.

From my distant point of view she seemed to be flying well, but not keeping at an even distance from the ground. Every few moments it appeared that Baldwin was about to alight, when he apparently changed his mind and steered her up again. The machine responded and rose without having touched the ground at the lowest point of her path.

This manoeuver was executed two or three times before the aerodrome shed was reached; but even here she did not land, and Baldwin rose again into the air although a end of the Baddeck River lay just beyond, which it would be necessary to avoid by a turn. It looked as though he intended to make a circuit of the testing ground, but in the middle of his turn, when he was quite near the River, he evidently decided to land and shut off the power.

The moment the engine stopped, the head of the machine went up in the air like a rearing horse, and the Drome made a bad landing, striking on her port wing and tail.

388

Considerable damage was done to the running-gear, and some struts were broken. Baldwin was unhurt; but Baddeck No 2 will be laid up for repairs for a few days.

Present on the field:— Baldwin, McCurdy, Bell, Hubbard, W. McDonald, John McDermid, and at least one other man whose name I do not know (Mr. Cox identifies him as Mr. Wm. McRae from one of the photographs appended). Mrs. Baldwin, and Miss Darling viewed the flight from the aerodrome shed.

Cause of Accident by AG Bell .

I have not yet talked with McCurdy and Baldwin about the cause of the accident; but I gain the impression that the center of gravity is too far back, and that they have attempted to remedy this by getting a lift from the tail by placing it at a positive angle to the line of advance (that is, rear depressed), relying on the consequent displacement of the center of pressure backwards to remedy the defect of the center of gravity, for they cannot well bring the engine further forward in the machine.

While the tail may thus support a considerable percentage of the load when the machine is in rapid motion, it will support much less when going more slowly; and it is conceivable that the machine, while properly balanced when in rapid flight, may perhaps become tail-heavy at slower speeds.

It is true, that the center of pressure moves backwards when the speed is reduced, both in the main surfaces 389 and the tail, but lifting power diminishes in greater ratio than reduction of speed, and it would be well to work out whether this would affect the balance. Not so sure of it myself.

A Lever Simile .

Imagine a large weight at the short end of a lever, balanced by a small weight at the opposite long arm of the lever. Now if we move the large weight nearer the fulcrum, and the small weight further away from the fulcrum, we certainly affect the balance.

Wind pressure acts upwards, and the center of pressure of the main surfaces represents the large weight near the fulcrum of our lever, and the center of pressure of our tail represents the small weight on the long end of the lever. When the speed slackens both centers of pressure move in the same direction backwards:— That is, the large weight moves towards the center of rotation, and the small one from it:— So that, if the machine was balanced in the first place, it would be unbalanced when the center of pressure moves. It seems to me however, that in any event the relative tail-

pressure would be increased and not diminished, so that it would not account for the head turning up when the power was cut off.

The amount of wind pressure, though reduced in both cases, would be proportionally reduced, and should not therefore affect the balance; but when the leverage is increased at one end, and reduced at the other, then there surely must be a disturbance of balance, and the element having 390 increased leverage will over-balance the other. This kind of action, though worthy of consideration, could not produce the effect noticed.

The slip-wind of the propeller .

Then again consider that the upward pressure on the tail is increased by the action of the slip-wind of the propeller upon it, and that this extra-lift is cut off when the engine stops.

Baldwin says that he shut off the engine before the elevation of the head occurred. McCurdy says that this machine (Baddeck No 2) always acts in this way, and turns up at the head when the propeller stops.

I am strongly inclined to think that the center of gravity is too far back; and that the depression of the tail to remedy that defect is a mistake, more especially when we consider that the tail receives the full blast of the propeller on its under surface, so that a sudden cessation of that blast would seriously disturb the balance.

I think the tail should have its surface parallel to the thrust of the propeller, and that support is no part of its proper function. The depression of the tail, while interfering with its stabilizing effect, also introduces sudden changes of air-pressure upon it when the propeller is started or stopped. If another supporting surface is needed behind the wing-piece, introduce it as a separate feature a la Langley, but keep the tail horizontal and fixed, to resist sudden changes of position by its stabilizing action.

391

Another thing I notice, indicating that Baldwin and McCurdy realize that the center of gravity is too far back, is that the balance wheel has been removed from the engine. I can't think why this should have been done unless to reduce the load of the engine, and thus bring the center of gravity of the whole machine a little further forward.

I will ask Douglas McCurdy to put down his own ideas of the cause of the accident before he reads my notes as he has just come in to the house-boat.

AGB.

Cause of accident by JAD McCurdy .

Sept 30 :— In all the flights so far, Casey and I have noticed the fact that the moment the power is shut off, just before landing, the machine has a tendency to rise, and in fact has done so:— But in previous flights a sudden depression of the front control just as the power was shut off, prevented this abnormal rise, and a good glide has resulted. Now this might be due to several causes:—

1. That the center of drive is too high.
2. That the center of gravity is too far back.
3. The third reason was suggested by Casey immediately after the accident, and I am inclined to think that he is right. I will leave him to write it for himself, as he has just come in. McC.

Cause of accident by FW Baldwin .

Sept 30 :— The machine got up nicely, and seemed to balance perfectly. After passing the shed I felt I was a 392 little too close to the River, and shut off. Immediately, the bow came up.

Instead of correcting this tendency at once, I tried to bring her down gradually. The result was that headway was partially lost; and the landing was bad, breaking the machine and two wheels. The cause of the tendency to shoot up when the power is shut off, seems to me to be the sudden reduction in the pressure under the tail, when the draught from the propeller suddenly stops.

P?B.

Discussion of accident resumed by A G Bell .

Sept. 30 :—We all three, Baldwin, McCurdy and I, seem to agree that the sudden lifting of the head when the power is cut off is due to the sudden cessation of the air-pressure on the under surface of the depressed tail.

Quite independently of any lift produced at the tail by the wind of advance, an additional lift is caused by the draught of the propeller pushing against the depressed tail.

While the machine is flying, this additional lift is compensated for, by suitable manipulation of the front control to keep the machine on a level course.

The extra-lift at the tail tends to tip the head down; the compensating action of the front control tends to steer the head up; and these two actions are equal and opposite.

Now cut off the extra-lift at the tail, and the front control is left steering the head up. Unless therefore the 393 front control is depressed as the engine power is shut off, the head will turn up.

Don't shut off Power while making a Turn .

There is another point not hitherto touched upon. At the time the engine was stopped Baldwin was in the midst of a turn to avoid the River. The vertical rudder at the rear was therefore turned to one side, and caught the blast of the propeller; and whatever steering action was caused by this draught was suddenly cut off when the propeller stopped. It is probable therefore that there was a disturbance of horizontal as well as vertical equilibrium.

Anyway it might be well to avoid shutting off power while making a turn.

Rear Surfaces Parallel to Propeller Thrust .

I would suggest that all the surfaces at the rear, whether horizontal or vertical, should be normally presented edgeways to the draught of the propeller. That is:— Their surfaces should be normally parallel to the direction of push.

When they are inclined at an angle to this direction, the wind of the propeller will create a pressure on one side of the surfaces and not on the other; and should the engine stop while the surfaces are so inclined, the sudden cessation of this pressure would create a sudden disturbance in the equilibrium of the machine.

AGB

394

1909, Oct. 7

147600-T

Baddeck No. II at the Aerodrome Shed, Bentick Farm, Big Baddeck. Photo by J. A. D. McCurdy.

147601-T

Baddeck No. II at the Aerodrome Shed, Bentick Farm, Big Baddeck. Photo by J. A. D. McCurdy.

395

147602-T

Baddeck No. II at the Aerodrome Shed Bentick Farm, Big Baddeck. Photo by J. A. D. McCurdy.

147603-T

Baddeck No. II at the Aerodrome Shed, Bentick Farm I , Big Baddeck. Photo by J. A. D. McCurdy.

396

138131-A

Drome Baddeck No. II at the Bentick Farm, Big Baddeck. Damage resulting from bad landing, Sept. 30 25 (from neg.). Front view. Photo by J. A. D. McCurdy.

138127-A

Drome Baddeck No. II at the Bentick Farm, Big Baddeck. Damage resulting from bad landing, Sept. 30 25 (from neg. Rear view. Photo by J. A. D. McCurdy.

397

1909, Oct 8, EDITORIALS & ARTICLES .

Vacuum balloons . By A G Bell.

Sept 30 :— Mr. Gardiner G. Hubbard came into the houseboat at the Bentick Farm to-day, and talked to me about balloons.

He asked whether anything had been done in the way of constructing a vacuum balloon; and expressed surprise that the idea had been suggested by Father de Lana so long ago as the century before the Montgolfier experiments.

I told him I did not know of any actual attempt at construction; and that it did not seem to be practicable to construct a balloon operating entirely by a reduction of atmospheric pressure within the balloon, because the crushing strains due to the external pressure become enormous when the internal pressure is much reduced, which would be necessary in order to have the balloon float.

He then spoke of internal framework to stand the strain; and suggested my old hydrogen-vacuum balloon idea.

If I understood him correctly he proposed to take a balloon calculated to stand pressure from without; fill it with hydrogen; and then partially exhaust the hydrogen.

I told him I believed that to be entirely practicable; and that I had myself worked at the idea, proposing to use an internal shell of tetrahedral frames.

398

Whether Gardiner Hubbard evolved the hydrogen-vacuum idea himself, or obtained it from others, he did not state; and our conversation was interrupted by the arrival of McCurdy, and then of Baldwin, who took my mind off the subject by discussing with me the cause of the accident to Baddeck No 2.

I will ask Mr. Hubbard to-morrow to make a note of what his idea is; for it may be that I am interpreting his thoughts in the light of my own ideas. AGB.

Ideas concerning balloons . By Gardiner G Hubbard

Oct 1:— At Mr. Bell's request I am writing down some random impressions of balloons.

I believe that these impressions of mine were suggested by previous discussions of the question with various people, by an account of the failure of a hydrogen balloon at San Francisco; and that the precisising of these ideas is due to my witnessing the seeming limitations of the heavier-than-air machines, by reading the account of de Lana, and by talks with Baldwin and McCurdy. It is hard to say to which influence I owe most.

I believe that the ultimate solution of aerial navigation will be by some machine that will be self-supporting. It will never do to depend for our support to an engine, which is so easily put out of commission.

399

To ensure speed and safety, I believe it will be necessary for the envelope of the balloon to be of metal, which immediately suggests attempting to produce a vacuum.

This is so difficult, or impossible to perform, that the question arises:— Is it not possible to fill a metal re-inforced body with hydrogen, and evacuate this sufficiently to secure a self-supporting body, strong enough to withstand the gales practical machine must encounter.

Such a balloon will be almost unaffected by atmospheric conditions; and can be controlled either by planes, or regulating the degree of the vacuum. GGH.

A E A ideas adopted by other aviators .

Oct 8:— Many of the features introduced into Aviation by the Aerial Experiment Association seem to have been incorporated, without acknowledgement, in recent aerodromes by others. Our lateral balancing-rudders are used abroad; and it will be observed from the photograph of Farman's machine given on p 400, that Farman employs Baldwin's method of strengthening the vertical struts against lateral deflection by tension wires attached to intermediate points of the struts.

In the Deutsche Zeitschrift fur Luftschiffahrt for Sept 22, 1909 appear two photos of "Herzog's double-decker" on p 856. This machine, built by Mr. Herzog of Harvard, Nebraska appears to be a direct copy of one of the A E A without acknowledgement. AGB.

400

1909, Oct.7

Mr. Henry Farman in his flight of 118 miles in three and a quarter hours at Rheims. Copied from the Illustrated London News of Sept. 4, 1909, by J. McNeil.

401

Latham's Antoinette seen from below, during the Gordon-Bennett Cup Race at Rheims. Copied from the Illustrated London News of Sept. 4, 1909, by J. McNeil.

402

1909, Oct.8 THE CHURCH OF ENGLAND PAGEANT by Mrs. Alexander Graham Bell

(A paper presented to the Ladies' Club of Baddeck) Oct. 7, 1909

On our arrival in England we found the country posted with small handbills and circulars about a Church of England Pageant to be held in London the coming month.

In remote Welsh hamlets, as in large provincial cities, the pageant was in the air. It was evident all Britain was thinking and talking of it, and being more or less stirred, even in the midst of a fierce parliamentary struggle. Illustrated weeklies printed pictures showing the play in various stages of preparation.

One in particular, I remember, appealed strongly to one's sense of the ludicrous. It represented a lot of City clerks in incongruous trousers and derbies devoutly knocking, under spread umbrellas, before a very melodramatic looking person swathed in rugs. Yet there was something in these pictured faces that checked laughter — they looked in earnest.

References to the Pageant abounded in the daily papers, and at last a long editorial in the Times determined us to see it for ourselves.

Just at first the idea of His Grace, the Archbishop of Canterbury, Primate of All England acting as patron; and the Very Reverend the Bishop of London, as Chairman of a dramatic performance had fairly taken away our breath. Ministers play-acting! Surely the world was coming to an end. Perhaps John 403 Knox and his followers are turning in their graves.

Yet I believe today, from its effect on myself, that no more powerful means could be devised for stirring to their depths great masses of people.

In estimating the impression made by this Church Pageant and the greatness of the influence it exerted, it is to be remembered that it proved such an over-whelming success financially, and in point of attendance that, originally intended to last ten days, its duration was prolonged to two weeks.

There were four thousand participants who gave their services freely for the pleasure they got out of it. They came from every diocese in London and were just every-day people, most with no especial dramatic ability, City clerks, clergyman, men and women from every walk of life; mothers with their babes, and school children. All these people had been drilling in odd moments, after hours, for the last six months.

Each scene in the Pageant was assigned to a different diocese. Thus there were different performers in every act, none of whom took part in any other, but everyone of whom returned to swell the assemblage at the end of the morning and evening performances.

It being impossible to concentrate even the merest summary of Church history into one performance, it was divided into two, lasting from three to six, and from eight to eleven.

The prices of these were very high and Fulham palace, where the pageant was held, is a long way from anywhere, a long way from fashionable Regent St. and Piccadilly, and a long way also from the homes of half middle-class London. It took us an hour to get there by fast taxicab, which gives an idea of the time required to go in cabs and busses.

Arrival at Fulham Palace

Long before we reached the palace garden entrance the streets showed signs of something ahead. Big billheads spoke of the pageant, swell automobiles, cabs, omnibusses, pedestrians, all bound one way, filled the road. By and bye strangely dressed figures mingled more and more commonly with the crowd or looked down from house balconies.

Finally we were stopped, from hence we had to walk. And walk we did for half a mile more through the beautiful shrubberies and gardens of Fulham Palace, the crowd meanwhile closing ever more tightly about us, but good humored and well behaved, till at last we came to a high pasteboard gateway fashioned like the entrance to some medieval walled city. There we had to wait for a few minutes, for of course we were late, and a scene was on.

But presently it was over and its participants came forth mingling out and disappeared in the crowd. They were in primitive garb, undressed skins, or rough cloths. I particularly noticed an air of gladness about them. They seemed like people out for a holiday thoroughly at home and enjoying themselves.

Then we passed through the gates and found ourselves in a large central lawn. Across one side, an enormous covered stand had been erected. Tier after tier of seats arose along its entire length, already holding practically its entire complement of three thousand spectators. On other sides the smooth green expanse stretched to its untouched boundaries of shrubberies and trees, except where another medieval city gate, with drawbridge and portcullis, closed a distant gap. Other theatrical scenery there was none.

The Pageant

In front of the Royal box which occupied the middle of the stand, a group of men and women in flowing red, yellow and green robes, and wearing laurel crowns, were gathered. They formed a sort of choir and were singing some stanzas beginning:—

Ye watchers and ye holy ones Bright Seraphs, Cherubim and Thrones Raise the glad strain Alleluya
Cry out Dominions, Princedo??, Powers, Virtues, Archangels, Angels, Choirs. Alleluya, Alleluya,
Alleluya, Alleluya, Alleluya.

There was no instrumental music, only the sound of hundreds of voices filled the air.

As they sang, assistants in costume rapidly set up a little church on the green, and, as the choir ceased and dispersed, groups of people in primitive dress appeared from among the trees and wandered about as one does now-a-days in a public park or Common. Some could be seen lightly talking and laughing among themselves. Others gradually came forward and knelt before the chapel, or entered therein, and presently the sound of singing proceeded thence.

Suddenly the every-day quiet was disturbed, and all crowded to watch the coming of a Roman procession. It marched forward and halted before the church. It was a soldierly crowd 406 of lictors, duumvire, and senators, escorting a two-wheeled chariot wherein two envoys were seated. They are come from the Emperor Constantine and bear to the Bishop Restitus his famous Edict of the year 314, grantin? religious liberty to the Christians.

Forth from the Chapel now comes the Bishop followed by virgins, deacons, and priests. The envoys seat themselves on a rostrum, the Edict in proclaimed, and handed to the Bishop for preservation in the Church. The Te Deum resounds from the church, and then all come out and disperse among the trees, and the scene is over.

The church is removed and the choir re-assembling takes up the thread of the singing:— “Thou hast hidden us O God from the gathering together of the froward, Alleluya; From the insurrection of the workers of iniquity, alleluya, alleluya. When the Lord turned again the captivity of Zion; then were we like unto them that dream.”

A bloodless victory

They continue singing until the next scene is called. This represents a great bloodless victory won by unarmed Christian Britons a hundred years later.

For this no scenery was used and most certainly none was needed. No setting could have been more ideal than the green award, shrubberies and trees.

Little change appears in the people, who by twos and threes spread out over the lawn. Among them comes the Bishop Germanus and an assistant, in Roman dress, bearing a tall crucifix. The Bishop proceeds to exhort and baptize, and all 407 is proceeding smoothly when suddenly pickets rush back crying, "The Scots are coming. The Scots are coming."

Panic threatens; but Germanus, who was as old Roman soldier, quies them. Obedient to his bidding they hide behind the trees, leaving him and the assistant kneeling alone beside the crucifix.

From the West now rush out a barbaric h?rde, with lances poised, who step astonished at sight of the motionless strangely-dressed two.

Mustering courage they approach, level their lances again when the Bishop arises, lifts on high his cross and shouts with a mighty voice:— "Alleluya, Alleluya, Alleluya."

Immediately the cry is answered by the hidden Britons; and from all sides — "Alleluya, Alleluya, Alleluya," with such startling effect, that one quite sympathizes with the utter demoralization of the enemy; who, rushing off, leave the Bishop in possession of the field.

The scene closes with the returned ?ritons crowding jubilantly about him, and all marching off chanting the Gloria Patria:—

"O Give thanks unto the Lord for he is gracious and His mercy endureth for-ever."

This scene is further remarkable as having been assigned as members of the Welsh Church of London who carried out the recital in ?elsh.

408

The conversion of the Plots

In the next scene St. Columba comes from Ireland to convert the Plots. They have established a village of rude huts and are employed, the men hunting and fishing, the women cooking over the open air fires, while children play about; and two? Braid?, white robed, gray-headed, laurel crowned, sacrifice at an altar.

St. Columba and a long retinue of priests march in, and plant the cross on the green amid the astonished silence of all. A disputation with the ensue.

Here I must confess my sympathy was not where I suppose the managers had intended. For to me this scene portrayed the power of might over helplessness, rather than the advance of Christianity.

Says one of the Druids, pathetically;—

“Here we are but two And you are many — All our words are weak Against this mighty argument you bring across the sea.”

Columba on the other hand arbitrarily ends his discourse with the statement that;—

“This cross, which here I set in sign of victory, (Shall) stand firm in every corner of your land. When all your skill and power shall be a half forgotten tale. Come, my brothers, mark out the limits of our dwelling place.”

409

1909, Oct.9 Enforced Celibacy of the Priests

The possibilities of tyranny latent in the Church, crops out through succeeding scenes and reaches its most heart-rending climax in one picturing the revival of monasticism in the tenth century.

The people who now gather are more advanced in civilization. They wear comfortable, bright-hued garments, and among them are the canons, or secular clergy, who are not distinguishable by any differences in dress.

The King and Queen on their gold throne are very gorgeous people indeed, and call on the blackrobed Bishop of Winchester to stand forth and speak, with much ceremony.

We bursts into a fiery denunciation of the luxury of the priests who have deserted their vows of celibacy. The objects of his attack listen agast, and their families crowd frantically about them.

The Queen throws herself before the King and pleads for them, and they defend themselves until even Dunstan, the Archbishop, seems about to yield; but the Winchester friar carries the day, and the canons are given their choice between their families, and their profession and livings.

The dark monks of Winchester fling black robes before the canons. The dumb following is long drawn cut, dramatic and harrowing to the last degree. Wives and children cling to husbands and fathers. Mothers lift their babies to the fathers, older children kneel supplicating. Slowly one after another makes his decision, picks up the fatal robe, and 410 joins the procession of monks; or, arm in arm with wife and child, hastens away.

At last but two pairs are left — an old man with his motherless daughter, and a young one with his wife and babies.

No one knew what these would do. The tense expectation could almost be felt. It was as if we were witnessing the actual fact — and we were — that was the horror of it. The thousand years separating us were bridged, and we were sharing the emotions of fellow creatures who were living, loving and suffering.

The old man moved first. He put aside his child, picked up the robe, and started to join the monks; hesitated, was lost, and returned to fall on his knees beside his little girl, passionately embracing her.

Through all the time when others had made their choice and departed, the young man had stood in front absolutely still, drawn to the full height of his splendid manhood, his eyes raised heavenwards, and his wife clasped tightly to his breast.

One saw the terrific struggle going on within him. He was one most truly ordained to the service of his God, asking nothing better than to serve Him all his days; and yet, not only his love but his manhood, admitted his wife's right.

"Those whom God hath joined together let not man put assunder."

What should it be, which was the right? At last Dunstan, the Archbishop laid his hand on his sleeve. Slowly he turned, regarded the Bishop in silence for a minute, then suddenly, 411 with a superb gesture, he swept aside the detaining hand, and, gathering his children in his arms, swiftly departed; and oh, the relief to us!

But the end was not yet. The old man and his daughter still clung together. Alas, with him the habit of a lifetime was too strong, and finally he did leave her.

The child crept after him, fell, arose again, struggled on, fell again and lay there, such a pathetic still little figure.

Slowly the people dispersed leaving her lying there, the one spot of life on the green.

Not quite deserted, however, for at the last the Queen sent for her and took her with her; and the Church had closed its hand over all the innocent love of its votaries.

Magna Charta

And so representation after representation of what we knew had once been most living reality passed before us. We saw King John on his throne morosely granting Magna Charter to his kneeling earls and barons.

Very different beings these, from the modern clerks whose bodies yet were inside the knightly armour. We saw gorgeous beings on horseback galloping about. We saw miracle plays performed before gentlemen and ladies who walked and talked and preened their fine feathers as naturally as their 20th Century counterparts.

412

End of Afternoon Performance

The finale of the afternoon performance was superb. All the performers from Ancient Plots, to the 15th Century ladies, gathered in long processions, marching and counter-marching, deploying in perfect time, following a great emblematic Ship of Church, bearing the motto "Onward Ever." The great audience stood up and all sang in unison:—

O Worship the King All glorious Above O gratefully sing His power and His love Our Shield and Defender The Ancient of Days Pavillon'd in splendour And girded with praise

O Faith of England, taught of old By faithful shepherds of the fold, The hallowing of our nation; Thou wast through many a healthy year, Through many a darkened day of fear, The rock of our salvation.

The Evening Performance

We were late again for the evening performance, arriving just in time to find ourselves in the thick of King Henry Vth's funeral leaving the grounds. Dukes, Earls, Knights, cantering past us on spirited horses, looked very genuine even at such close quarters.

Again the spontaneity and heartiness prevailing the whole pageant was most marked. All identified themselves with the part they were playing. Unlike ordinary professional actors they were in no hurry to cast aside their parts, and 413 though now on their way to the stables, were still the great nobles they represented.

As the dusk deepened into night, limelights and searchlights from unseen sources, flashed on the lawn, till it was nearly as light as day.

In this light the history of the Church was carried down to the end of the 18th Century. We saw the coronation of the boy King Edward VI, the execution of Archbishop Laud, and the sequestration of the convents, which was a particularly appealing scene.

White robed nuns were seen leaving their ancient home, and passing away through a crowd of peasants, who alternately knelt and kissed the hem of their robes, or jeered and cursed, while children played unheeding.

A fierce and very realistic battle on horseback, between the knightly adherents of the nuns, and officers of the King, enlivened its close; and slowed the dramatic possibilities of these open air pageants, as against the restraints imposed on theatrical managers.

The closing Scene

The end was unsurpassable in beauty and effectiveness. Procession after procession on horseback and afoot, of the previous performers, and new ones, carrying banners of modern Church Societies and Sects, followers of Wesley, Abolitionists, High and Broad Churchmen, marched and deployed while the audience joined in singing the Nicene Creed.

414

Then candles were lighted till every one of the marchers held one, and the limelights were turned off, so that all the light came from the row after row of moving candles.

In slow rhythmic movements the lights approached and retreated, approached and retreated again, while the singing of "O God our Help in Ages past", fills the air.

There is a final burst of song;—

All people that on earth do dwell, Sing to the Lord with cheerful voice; Him serve with fear, his praise forth tell, Come ye before Him, and rejoice.

and simultaneously, all the lights are extinguished; and we stand breathless, wrought up to the last pitch of exhilaration, and darkness reigns supreme.

Impressions left by the Pageant

I have dwelt thus at length on this pageant, not because it is any more impressive than others, but because I saw it and feel its effects.

What one individual experiences is of little moment, but the impression made on the four thousand performers, and the fifty odd thousand who saw it, is of immense importance. The impression made on me is indelible, no must it have been on many indeed, of those thousands.

The Pageant as a means of Education .

These displays have been going on now for some years and are increasing in number and becoming more wide-spread every 415 year. It is therefore evident that they have significance. It may even be that they will soon become a factor in our life to be reckoned with, the underlying cause of which it may be well to study. The Archbishop of Canterbury and the much loved Bishop of London are not men to lightly give their sanction to such displays. They must believe them to be instruments of power and indeed this is what the Bishop himself says:—

“We want this pageant to be an education for old and young and we hope that it will show by its pictures of bygone life and the influence which religion had upon that life, something of the struggles and the trials of those who fought for the faith.”

Evidently therefore they believe that our present systems of education do not entirely meet all our needs.

Are they right? Does our present system fulfil every demand? Everyone now-a-days can read and write o? sorts, but how many of those who leave school continue their studies and delight in instructive reading? And of those who do, how many can honestly say that they possess a clear and graphic idea of things from what they have learned?

How many have acquired such understanding of our past history that they knew why we are here and the influences that governed our fore-fathers? Is it not evident that our book knowledge falls short in giving us all the education we should have.

In the Middle Ages men were taught through their senses. Monks encouraged miracle plays for their entertainment and instruction. Beautiful cathedrals were built and filled with the sounds of beautiful music. Their walls were hung with the greatest pictures, their windows filled with stained glass that people might be taught. Their worship, their education, and their pleasures, were thus combined.

Our own lives are empty of all this. We have instead, much precise knowledge that they knew nothing of, and comfort they never dreamt, but should we deny ourselves the innocent pleasures and the beauty they had?

That we still retain the instinct for them is before our eyes every day. Watch your boy as he plays Captain Kidd or Red Indian; your girl as she "dresses up" and pretends that she is somebody else. Is there not here something our teachers may well enlist to lighten the drudgery of their school work.

Listen to the lifeless monotone of the class at out in a row reciting "by heart" some selection from the reading book. Suppose instead, the teacher were to suggest the children should "play soldier," dress in uniform, and give "The Charge of the Light Brigade", to sing and act out. Isn't it conceivable, that she would got a very different recitation; and that an impression would be made which would be lasting. Might not the education thus unconsciously acquired of patriotism, be worth whole volumes of written history?

Might it not therefore be possible that in pageantry we have at last a form of instruction that should be incorporated into our school systems and carried out as a regular part of school work?

417

Pageant Illustrating the History of Cape Breton

To be specific, how many of us here know the history of our own Island of Cape Breton, and of Baddeck, although have passed through its schools and have access to books of history? How many realize the materials for the most thrillin? , that are lying? an-rare? about us.

More, right here, as fought the final battle of the Century-long strife between Caul and Briton which began in the Dark Ages.

These hills and Lakes have witnessed the of races, and the coming of others. Indians and French, ?
iving place to the Crofters of Scotland.

Suppose we set our school children, and some of us also, to the depicting of this history and acting it
out as a pageant next summer. Would it not be impressed on the minds of , old and young, in a way
which none would forgot, and Cape Breton, our Island Home, words to conjure with. MGB

418

OUR LOG OF THE CRUISE IN "SCRAPPER" . By the Bentick Farm Campers.

A is for Asses who went on a cruise,

B is the Bottle in which was no b??ze,

C is for Casey so gallant and bold,

D is the Dinner which he couldn't hold,

E is for everything they left behind,

F for the fools our bid who declined,

G is the ground we struck on the way,

H is for Holl which the Captain did say,

I is the instant we all got her free,

J is the jump she took in her glee,

K is for Kathleen so nimble and thin,

L for the Lunch which she left on her chin,

M's for Mosquitoes that kept us awake,

N is the nonsense we talked till day break,

O stands for Ocean so still and so blue,
P is the Paddling the frills had to do,
Q's for the Questions we asked at the docks,
R the Replies which to us were great shocks,
S is for Scrapper the name of the ship,
T for the Tow-best we lost on the trip,
U is the Unity we three did keep,
V the Viniolia we dropped in the deep,
W's for Win who came with delight,
X the 'xcuse for missing the flight,
Y for 'Ycogemagh where we started the stuffing,
Z was our "Zorrow" when told we'd get nothing.

419

BEINN BHREAGH ITEMS .

An old relic .

Oct 2: — A large box arrived at Beinn Bhreagh to-day from Quebec containing a present to Dr. and Mrs. Bell from Mr. and Mrs. Fairchild. On opening it, it was found to contain a chair more than one hundred years old, which had formerly been owned by Dr. Bell's great-grandfather, Andrew Colville of Gauldrie, Scotland.

Mrs. Fairchild has just returned to America after a visit to the little village of Gauldrie in Fifeshire, which was the home of her great-great-grandfather, Andrew Colville, and she there purchased the chair from a very old lady who remembers Andrew Colville in her young days.

The box also contained purchases at the Church Fair in Gauldrie. AGB

Gardiner Hubbard leaves BB .

Oct 4: — Mr. Gardiner G. Hubbard left BB this afternoon Oct 4, for Sydney on route for Truro, Boston and New York. AGB

Oct 4: — Mrs. Gilbert H. Grosvenor and her children, Melville, Gertrude, Mabel, and Lilian dined at BB Hall today. AGB

Oct 9 :— I give on the next page an account of the school childrens visit to Beinn Bhreagh together with their names. Account was written by Miss Christine McLellan. CRC

420

School Children visit BB .

Oct 9: — On Tuesday (Sept 27), Mrs. Bell of Beinn Bhreagh, invited the School Children, Teachers, and Friends to see her beautiful garden and flowers.

The children were taken on board the Gauldrie at Baddeck about 3:30 P.M. and landed at the "Rock", near BB Hall. They were received by Mrs. Bell, Miss Caroline McCurdy, Mrs. Grosvenor. A tour was then made in the garden where the flowers were very much admired by the teachers and pupils. The younger children were allowed to play with Miss McCurdy's dog "Gen. Wolf". From the garden the children were taken to see the Scotland Pony, and the Zulu Sheep. The boys were very much taken up with the Zulu Sheep and admired them for their horns. On returning to BB Hall the children were shown into the dining room where refreshments were served. The older boys now appointed a Captain, and marched in a body to the house-boat, and returned just in time to catch the boat. Mrs. Bell gave each one of the children a large bouquet of flowers cut from her garden. They all said they had a fine time, and enjoyed the sail back to Baddeck in the moonlight. CM.

Names of people at BB Hall Sept 27, 1909.

(Copied from BB Hall visitors book)

Louise F. Crowdis

Marjorie A. Crowdis

Louise McDonald (Teacher)

Miss Watson (Teacher)

Clarence Bethune

Margaret McKay

Jack McLeod

Douglas Fraser

Bessie MacAskill

Fannie F. McKay

Miss McLean (Principal)

Miss Fraser (Teacher)

Catherine McAulay

Rodina McLeod

Cassie Nicholson

Eleanor Blanchard

421

Lilian McLean

Warren Gilman

Murdoch Stewart

Catherine McRae

Maggie McKensie

Ruby McDonald

Jessie Hickey

Margaret McLeod

Norman Bethune

Elizabeth MacAskill

Ruth McDonald

Barrington MacAskill

Janie Campbell

Ambrose McNeil

Freda Haliburton

Annie Blesedell

Catherine McDonald

Hanna McLeod

Christie McLeod

Mabel McAuley

Alexander McLeod

Anna Bell MacAskill

Rachel McDermid

Mary Blanchard

Flora McDonald

Murdoch McDermid

Sanford Burke

Archibald Anderson

Robbie Watson

Donald McDonald

Dan J. McDonald

John Gillis

Christie Stewart

Lexina Stewart

Roddie McDonald

Willie McLean

Ellen Ongo

May McDonald

Maurice Watson

Dan Stewart

Winnie MacAskill

May McAulay

Elisa McDonald

Michael McNeil

Lissie Ongo

Florrie McLean
Florence McDonald
Dorothy Crowdis
Margaret Hutchinson
Nellie McDonald
Mary McKensie
Margarita MacAskill
Jessie McDonald
Annie McKenzie
Mabel Anderson
Mary Watson
Ian McAuley
John McKay
Peter Campbell
Alexander McDonald
Ralph Peters
422

1909, Oct 11, KITE DATA OCT 7 .

Secured with model of Cygnet II.

Conditions Observations Date Exp FL HL Wind Pull Altitude Oct 7 1 r125 c200 36.26 km 51.2 kg
14°.3 Oct 7 2 r125 c200 34.60 km 43.6 kg 13°.5 Oct 7 3 r125 c200 34.80 km 39.6 kg 12°.6 Oct 7

4 r125 c200 36.00 km 45.6 kg 14°.5 Oct 7 5 r125 c200 38.00 km 56.8 kg 13°.9 Oct 7 6 r125 c200 36.60 km 51.6 kg 13°.7 Oct 7 7 r125 c200 39.50 km 56.4 kg 12°.9 Oct 7 8 r125 c200 36.40 km 42.8 kg 13°.4 Oct 7 9 r125 c200 34.25 km 49.2 kg 14°.0 Oct 7 10 r125 c200 38.70 km 46.4 kg 14°.9 Oct 7 11 r125 c200 38.50 km 53.4 kg 13°.8 Oct 7 12 r125 c200 36.00 km 46.4 kg 12°.4 Oct 7 13 r125 c200 37.65 km 47.2 kg 14°.5 Oct 7 14 r125 c200 39.10 km 62.8 kg 14°.5 Oct 7 15 r125 c200 37.80 km 47.6 kg 14°.1 Oct 7 16 r125 c200 31.00 km 35.2 kg 15°.4 Oct 7 17 r125 c200 32.80 km 38.6 kg 15°.9 Oct 7 18 r125 c200 32.20 km 42.6 kg 13°.4 Oct 7 19 r125 c200 34.30 km 41.2 kg 11°.6 Oct 7 20 r125 c200 32.50 km 43.6 kg 13°.2 Oct 7 21 r150 c200 48.60 km 48.4 kg 10°.2 Oct 7 22 r150 c200 48.70 km 60.4 kg 11°.1

During experiment 23 the kite came into the water and was damaged beyond repair. Photographs of this kite are shown on p.53; kite data secured by its means are given on pp 54,132,260,251,262,257,360 and above.

The destruction of this model of Cygnet II does not involve the stoppage of the experiments. We have a duplicate with which experiments will now be continued. AGB.

423

QUERY EXPERIMENTS OCT 5-6 .

Conditions Speed Pull Remarks Date Exp HL Miles Sec lbs Up course Oct 5 1 -L 0.25 95 25.0 Carruth's to Baddeck Oct 5 2 -L 0.25 85 36.2 Oct 5 3 -L 0.25 70 52.0 Oct 5 4 -L 0.25 62 56.0 Oct 5 5 -L 0.25 55 39.0 Oct 5 6 -L 0.25 61 67.5 Oct 5 7 -L 0.25 54 68.0 Oct 5 8 -L 0.25 60 89.5 Down course Oct 5 9 -L 0.25 120 22.0 Baddeck to Carruth's Oct 5 10 -L 0.25 95 31.5 Oct 5 11 -L 0.25 90 36.0 Oct 5 12 -L 0.25 55 59.0 Oct 5 13 -L 0.25 63 65.5 Oct 5 14 -L 0.25 57 73.0 Oct 5 15 -L 0.25 50 72.5 Oct 5 16 -L 0.25 50 74.5 Up course Oct 6 1 H- 0.25 125 39.0 Oct 6 2 H- 0.25 102 56.5 Oct 6 3 H- 0.25 90 48.5 Oct 6 4 H- 0.25 64 56.0 Oct 6 5 H- 0.25 60 54.5 Oct 6 6 H- 0.25 61 53.0 Oct 6 7 H- 0.25 52 52.0 Oct 6 8 H- 0.25 59 55.3 Down course Oct 6 9 H- 0.25 135 57.0 not out of water Oct 6 10 H- 0.25 90 70.0 rising Oct 6 11 H- 0.25 80 69.5 rising Oct 6 12 H- 0.25 67 60.5 rising Oct 6 13 H- 0.25 53 52.0 completely out Oct 6 14 H- 0.25 60 51.0 completely out Oct 6 15 H- 0.25 55 49.0 completely out Oct 6 16 H- 0.25 66 56.0 completely out

Note:— H stands for hydro-surfaces.

L stands for lead. When the hydro-surfaces are not used the boat is loaded with 50 lbs. of lead, the equivalent weight of the hydro-surfaces. AGB.

424

QUERY EXPERIMENTS OCT 8 .

Conditions Speed Pull Bedwin's Remarks Date Exp HL Miles Sec lbs Up course Oct 8 1 H- 0.25 147 49.5 starting up forward Oct 8 2 H- 0.25 99 60.0 Not quite out Oct 8 3 H- 0.25 84 52.0 out of water Oct 8 4 H- 0.25 72 51.5 well out Oct 8 5 H- 0.25 54 48.5 out and flopping Oct 8 6 H- 0.25 62 54.0 still out Oct 8 7 H- 0.25 52 48.0 still out Oct 8 8 H- 0.25 60 50.0 still out Down course Oct 8 9 H- 0.25 120 50.0 not out Oct 8 10 H- 0.25 115 69.0 nearly out Oct 8 11 H- 0.25 67 58.0 out Oct 8 12 H- 0.25 64 53.0 out and flopping Oct 8 13 H- 0.25 60 54.5 well out & flopping Oct 8 14 H- 0.25 62 54.5 still out Oct 8 15 H- 0.25 54 56.5 still out Oct 8 16 H- 0.25 60 54.5 still out Up course Oct 8 1 -L 0.25 125 23.0 Carruth's to Baddeck Oct 8 2 -L 0.25 87 33.0 Oct 8 3 -L 0.25 83 52.5 Oct 8 4 -L 0.25 67 63.0 Oct 8 5 -L 0.25 56 70.5 Oct 8 6 -L 0.25 60 79.5 Oct 8 7 -L 0.25 57 78.5 Oct 8 8 -L 0.25 62 83.0 Down course Oct 8 9 -L 0.25 115 21.0 Baddeck to Carruth's Oct 8 10 -L 0.25 90 30.0 Oct 8 11 -L 0.25 80 41.5 Oct 8 12 -L 0.25 58 60.0 Oct 8 13 -L 0.25 63 69.5 Oct 8 14 -L 0.25 61 73.5 Oct 8 15 -L 0.25 53 74.0 Oct 8 16 -L 0.25 60 77.0

Note:— H stand for hydro-surfaces.

L stands for lead. When the hydro-surfaces are not used the boat is loaded with 50 lbs. of lead, the equivalent weight of the hydro-surfaces

AGB.

425

Oct. 15, QUERY EXPERIMENTS OCT 9 .

Conditions Speed Pull Remarks Date Exp HL Miles Sec lbs Up Course Oct 9 1 -L 0.25 129 14.0 Oct 9 2 -L 0.25 101 23.5 Oct 9 3 -L 0.25 98 30.0 Oct 9 4 -L 0.25 66 45.5 Oct 9 5 -L 0.25 69 59.5 Oct 9 6 -L 0.25 52 65.0 Oct 9 7 -L 0.25 55 70.0 Oct 9 8 -L 0.25 60 69.0 Down Course Oct 9 9 -L 0.25 126 14.0 Oct 9 10 -L 0.25 90 22.0 Oct 9 11 -L 0.25 92 31.0 Oct 9 12 -L 0.25 72 47.5 Oct 9 13 -L 0.25 34 60.0 Oct 9 14 -L 0.25 62 66.0 Oct 9 15 -L 0.25 54 69.0 Oct 9 16 -L 0.25 63 69.0 Up Course Oct 9 1 H- 0.25 146 50.0 Oct 9 2 H- 0.25 114 63.5 Oct 9 3 H- 0.25 100 63.0 Oct 9 4 H- 0.25 68 62.0 Oct 9 5 H- 0.25 67 71.5 Oct 9 6 H- 0.25 62 61.0 Oct 9 7 H- 0.25 65 61.0 Oct 9 8 H- 0.25 61 58.5 Down Course Oct 9 9 H- 0.25 170 36.0 Oct 9 10 H- 0.25 113 54.5 Oct 9 11 H- 0.25 99 45.0 Oct 9 12 H- 0.25 78 60.5 Oct 9 13 H- 0.25 58 34.0 Oct 9 14 H- 0.25 64 62.0 Oct 9 15 H- 0.25 54 58.0 Oct 9 16 H- 0.25 64 52.0 426

QUERY EXPERIMENTS OCT 11.

(First set)

Conditions Speed Pull Remarks Date Exp HL Miles Sec lbs Up Course Oct 11 1 -L 0.25 140 16.0
Oct 11 2 -L 0.25 98 19.0 Oct 11 3 -L 0.25 97 28.5 Oct 11 4 -L 0.25 78 36.5 Oct 11 5 -L 0.25 61
48.5 Oct 11 6 -L 0.25 61 60.0 Oct 11 7 -L 0.25 55 63.6 Oct 11 8 -L 0.25 65 62.5 Down Course
Oct 11 9 -L 0.25 143 10.0 Oct 11 10 -L 0.25 97 25.0 Oct 11 11 -L 0.25 90 34.0 Oct 11 12 -L 0.25
62 55.0 Oct 11 13 -L 0.25 62 56.0 Oct 11 14 -L 0.25 61 65.5 Oct 11 15 -L 0.25 56 59.5 Oct 11
16 -L 0.25 61 65.5 Up Course Oct 11 17 -L 0.25 145 10.0 Oct 11 18 -L 0.25 95 16.5 Oct 11 19 -L
0.25 96 30.0 Oct 11 20 -L 0.25 79 39.5 Oct 11 21 -L 0.25 55 49.0 Oct 11 22 -L 0.25 62 59.5 Oct
11 23 -L 0.25 56 64.5 Oct 11 24 -L 0.25 62 65.5 Down Course Oct 11 25 -L 0.25 138 13.0 Oct
11 26 -L 0.25 102 24.0 Oct 11 27 -L 0.25 67 37.5 Oct 11 28 -L 0.25 63 52.5 Oct 11 29 -L 0.25 61
63.5 Oct 11 30 -L 0.25 64 63.0 Oct 11 31 -L 0.25 55 66.5 Oct 11 32 -L 0.25 62 69.0 427

CURRY EXPERIMENTS OCT. 11. (Second Set).

Conditions Speed Pull Remarks Date Exp HL Miles Sec lbs Up Course. Oct 11 1 H- 0.25 147
40.0 Hardly any lift Oct 11 2 H- 0.25 101 52.0 well out forward Oct 11 3 H- 0.25 92 50.5 just out
Oct 11 4 H- 0.25 70 54.5 well out & flopp?ng Oct 11 5 H- 0.25 55 55.0 still out & flopping Oct
11 6 H- 0.25 63 60.5 out & flopping Oct 11 7 H- 0.25 55 55.0 out & flopping Oct 11 8 H- 0.25
63 60.0 out & flopping Down Course Oct 11 9 H- 0.25 153 44.5 Oct 11 10 H- 0.25 112 60.0 Out
forward Oct 11 11 H- 0.25 105 58.5 just out. Oct 11 12 H- 0.25 65 72.0 well out Oct 11 13 H-
0.25 66 68.0 out & flopping Oct 11 14 H- 0.25 68 69.5 out & flopping Oct 11 15 H- 0.25 58 76.5
out & flopping Oct 11 16 H- 0.25 65 76.5 out & flopping Up Course Oct 11 17 H- 0.25 140 45.0
Not out Oct 11 18 H- 0.25 92 65.0 Nearly out Oct 11 19 H- 0.25 93 57.5 well out Oct 11 20 H-
0.25 68 65.5 out & flopping Oct 11 21 H- 0.25 57 66.0 out & flopping Oct 11 22 H- 0.25 62 72.0
out & flopping Oct 11 23 H- 0.25 38 83.0 out & flopping Oct 11 24 H- 0.25 61 80.0 out & flopping
Down Course Oct 11 25 H- 0.25 160 45.0 not out Oct 11 26 H- 0.25 118 65.0 Not out Oct 11 27
H- 0.25 100 72.0 nearly out Oct 11 28 H- 0.25 72 81.5 all out. Seems heavy Oct 11 29 H- 0.25
64 86.0 wind increasing Oct 11 30 H- 0.25 68 86.0 Wind & waves. Oct 11 31 H- 0.25 58 86.0
Wind & waves Oct 11 32 H- 0.25 64 88.0 Wind & waves. 428

CURRY EXPERIMENTS OCT 5-11. SUMMARY TABLE.

(-L) No hydro-surfaces. Lead ballast.

Successive ¼ miles Up Course Down Course Total Obs Sec lbs Obs Sec lbs Obs Sec lbs 1st 5
634 82.0 5 642 80.0 10 1276 162.0 2nd 5 466 128.2 5 474 132.5 10 940 260.7 3rd 5 444 193.0 5
439 162.0 10 883 375.0 4th 5 334 242.5 5 310 274.0 10 664 516.5 5th 5 294 286.5 5 303 324.5
10 597 611.0 6th 5 296 331.5 5 306 343.0 10 601 674.5 7th 5 277 344.5 5 268 353.5 10 545
698.0 8th 5 309 349.5 5 296 355.0 10 605 704.5

(H-) Hydro-surfaces. No land ballast.

Successive ¼ miles Up Course Down Course Total Obs Sec lbs Obs Sec lbs Obs Sec lbs 1st
5 708 223.0 5 738 264.? 10 144? 488.0 2nd 5 508 297.0 5 548 315.5 10 1056 615.5 3rd 5 464
271.5 5 451 303.0 10 215 574.5 4th 5 342 289.5 5 346 327.5 10 688 617.0 5th 5 293 295.5 5
301 314.5 10 594 610.0 6th 5 310 300.5 5 322 322.0 10 632 622.5 7th 5 272 299.0 5 279 326.0
10 551 625.0 8th 5 304 304.0 5 324 327.0 10 628 631.0 429

EXPERIMENTS OCT 5-11 AVERAGES

(-L) No hydro-surfaces. Lead Ballast

Successive ¼ miles Average Time Speed Pull 1st 127.6 sec 7.0 mph 16.20 lbs 2nd 94.0 sec 9.?
mph 26.07 lbs 3rd 87.3 sec 10.2 mph 37.50 lbs 4th 66.4 sec 17.5 mph 51.65 lbs 5th 69.7 sec
16.1 mph 61.10 lbs 6th 60.1 sec 16.0 mph 67.48 lbs 7th 54.5 sec 16.5 mph 69.80 lbs 8th 60.5
sec 14.9 mph 70.4? lbs

(H-) Hydro-surfaces. No lead Ballast

Successive ¼ miles Average Time Speed Pull 1st 144.6 sec 6.2 mph 48.?0 lbs 2nd 105.6 sec
6.5 mph 61.55 lbs 3rd 91.5 sec 9.8 mph 57.45 lbs 4th 68.8 sec 13.1 mph 61.70 lbs 5th 59.4 sec
15.1 mph 61.00 lbs 6th 53.2 sec 14.2 mph 62.25 lbs 7th 55.1 sec 16.4 mph 62.50 lbs 8th 62.8
sec 14.3 mph 63.10 lbs 430

1909, Oct. 16 ?UERY EXPERIMENTS OCT 5-11 Summaries and Averages arranged by Grounded Speeds in miles per hour

(-L) No hydro-surfaces. Lead Ballast

Summary Average Grouped Speeds miles per hr No of Obs Time ¼ mile in sec Pull in lbs Time
¼ mile in sec Speed in mph Pull in lbs 6 & 7 mph 9 1181 127.0 131.2 6.9 14.1 8 & 9 mph 11
1066 284.0 96.9 9.3 25.8 10 & 11 mph 11 939 402.7 65.3 10.5 36.6 12 & 13 mph 6 411 328.0
68.5 13.1 54.6 14 & 15 mph 27 1651 1794.0 61.1 14.7 66.4 16 & 17 mph 16 863 1056.5 53.9
16.7 66.0

(H-) Hydro-surfaces. No lead Ballast

Summary Average Grouped Speeds miles per hr No of Obs Time ¼ mile in sec Pull in lbs Time
¼ mile in sec Speed in mph Pull in lbs 4 & 5 mph 3 463 127.5 161.0 5.6 42.5 6 & 7 mph 11 1423
612.5 129.3 7.0 65.6 8 & 9 mph 11 1095 640.0 99.5 9.0 58.1 10 & 11 mph 5 427 ?00.5 85.4 10.6
60.1 12 & 13 mph 14 949 972.0 67.7 13.3 66.5 14 & 15 mph 26 1589 1636.0 61.1 14.7 62.9 16 &
17 mph 10 539 535.0 53.? 16.7 63.5 431

KITE DATA JULY 26–OCT 7 Secured with model of Cygnet II

GENERAL SUMMARY

Conditions Grouped Summation FL BL alts Exp Wind Pull Altitude r 50 c200 38°–39° 19 obs
484.50 km 1228.4 kg 749.2 r 50 c200 40°–41° 20 obs 461.90 km 1387.9 kg ?13.0 r 50 c200 42°–
43° 1 obs 23.40 km 70.8 kg 42.9 r 75 c200 12°–13° 1 obs 24.40 km 22.6 kg 13.3 r 75 c200 18°–
19° 1 obs 26.40 km 25.8 kg 19.1 r 75 c200 20°–21° 6 obs 158.65 km 167.2 kg 128.3 r 75 c200
22°–23° 6 obs 156.85 km 135.6 kg 137.4 r 75 c200 24°–25° 6 obs 172.90 km 185.6 kg 147.7 r
75 c200 28°–29° 4 obs 135.30 km 215.8 kg 118.8 r 75 c200 30°–31° 15 obs 521.10 km 841.6 kg
461.0 r 75 c200 32°–33° 1 obs 37.40 km 59.4 kg 32.1 r100 c200 10°–11° 3 obs 76.61 km 59.9
kg 33.1 r100 c200 12°–13° 5 obs 156.57 km 129.2 kg 78.3 r100 c200 14°–15° 13 obs 358.18
km 302.5 kg 192.6 r100 c200 16°–17° 22 obs 615.31 km 548.4 kg 373.7 r100 c200 18°–19° 24
obs 686.86 km 869.9 kg 454.8 r100 c200 20°–21° 22 obs 712.37 km 863.6 kg 458.0 r100 c200
22°–23° 13 obs 437.21 km 569.6 kg 295.4 r100 c200 24°–25° 1 obs 34.61 km ?0.0 kg 25.0 r100
c200 26°–27° 1 obs 33.17 km 41.6 kg 26.9 r125 c200 10°–11° 1 obs 34.30 km 41.2 kg 11.6 r125
c200 12°–13° 10 obs 359.10 km 476.6 kg 132.8 r125 c200 14°–15° 9 obs 353.6? km 424.0 kg
142.1 r150 c200 10°–11° 2 obs 97.30 km 108.8 kg 21.3 r 50 c200 40 obs 992.00 km 2687.1 kg
1605.1 r 75 c200 40 obs 1233.00 km 1673.6 kg 1058.5 r100 c200 105 obs 3114.89 km 3234.7
kg 1937.8 r125 c200 20 obs 716.95 km 961.8 kg 276.5 r150 c200 2 obs 97.30 km 108.8 kg 21.3
432

1909, Oct. 19, KITE DATA JULY 26–OCT 7 Secured with model of Cygnet II

GENERAL AVERAGES

Conditions Grouped Average FL BL alts Exp Wind Pull Altitude r 50 c200 38°–39° 19 obs 25.50
km 64.6 kg 39°.4 r 50 c200 40°–41° 20 obs 24.09 km 69.4 kg 40°.6 r 50 c200 42°–43° 1 obs
25.40 km 70.8 kg 42°.9 r 75 c200 12°–13° 1 obs 24.40 km 22.6 kg 1?°.3 r 75 c200 18°–19° 1 obs
26.40 km 25.8 kg 19°.1 r 75 c200 20°–21° 6 obs 26.44 km 27.9 kg 21°.4 r 75 c200 22°–23° 6 obs
26.14 km 25.9 kg 22°.9 r 75 c200 24°–25° 6 obs 28.81 km 30.9 kg 24°.6 r 75 c200 26–29° 4 obs

33.82 km 53.9 kg 29°.7 r 75 c200 30°–31° 1? obs 34.74 km 36.1 kg 30°.7 r 75 c200 32°–33° 1
obs 37.40 km 59.4 kg 32°.1 r100 c200 10°–11° 3 obs 26.20 km 20.0 kg 11°.0 r100 c200 12°–13°
6 obs 26.42 km 21.5 kg 13°.0 r100 c200 14°–15° 13 obs 27.55 km 23.3 kg 14°.8 r100 c200 16°–
17° 22 obs 27.96 km 24.9 kg 17°.0 r100 c200 18°–19° 24 obs 28.61 km 27.9 kg 18°.9 r100 c200
20°–21° 22 obs 32.38 km 39.2 kg 20°.8 r100 c200 22°–23° 13 obs 33.6? km 43.8 kg 22°.7 r100
c200 24°–25° 1 obs 34.61 km 50.0 kg 25°.0 r100 c200 26°–27° 1 obs 33.17 km 41.6 kg 26°.9
r125 c200 10°–11° 1 obs 34.20 km 41.2 kg 11°.6 r125 c200 12°–13° 10 obs 35.91 km 47.7 kg
13°.3 r125 c200 14°–15° ? obs 39.2? km 47.1 kg 16°.8 r150 c200 10°–11° 2 obs 4?.85 km 34.4
kg 10°.6 r 50 c200 40 obs 24.60 km 67.2 kg 40°.1 r 75 c200 40 obs 30.62 km 41.8 kg 26°.4 r100
c200 105 obs 29.66 km 30.? kg 1°.4 r125 c200 20 obs 35.64 km 47.1 kg 13°.8 r150 c200 2 obs
48.?? km 54.4 kg 10°.8

Index to Beinn Bhreagh Recorder

Introductory remarks to the Editor 1–2

Beinn Bhreagh items July 1 to 22 3–9

The return of Dr. and Mrs. Bell 3

Aerodrome Park for Baddeck 3

A birth at Beinn Bhreagh Hall 3

Baddeck citizens visit Aerodrome Factory 4

Water supply for Baddeck 4

Arrival of Mrs. Fairchild and family 7

A long flight by Curtiss 7

McCurdy leaves for Petewawa 8

Arrival of the yawl “J.A. McCoch” 8

Names of the Princeton students on board 8

A dog climbs the Tetrahedral Tower 8

List of Experiments July 1-22 9-10

Discussion concerning Aerodromes by Bell, McCurdy & Bedwin. 10-16

Some objections to the use of a Vertical Rudder 17-20

Side winds interfere with steering 17

Remedied by balancing surface in front 17

Produces a dive when turning 18

Birds do not use vertical rudders 18

Lateral rudders would do the work 20

Obtaining power from the Sun's Rays 21-24

Heating soot in a bottle by sun's rays 21

What power could be obtained in this way 22

Apparatus proposed to test the point 22

Class transparent to light, not heat 23

Hard rubber transparent to heat not light 24

Mic?e transparent to both 24

Beinn Bhreagh items, July 23 to July 30 25-31

Arrival of pony from England 25

Party at McCurdy Homestead 25

Arrival of Dr. Richardson 25

Departure of the "J.A. McCoch" 25

Visit from Mr. Hassler 25

A challenge from the Laboratory 25

Beinn Bhreagh beats Baddeck 26

Davidson's advertisement about sheep 26

Arrival of Dr. Grenfell 27

The first automobiles to visit B. B. 27

Mr. Prost's first visit since marriage 27

Hospital sledge for Dr. Grenfell 27

Meeting at B.B. addressed by Dr. Grenfell 28

An Aero Club for Beinn Bhreagh 28

Departure of Mrs. Fairchild 29

A dangerous insect at Beinn Bhreagh 29

Accident to Jim McKenzie's son 29

Arrival of the "Enchantress" 30

Accident to Mrs. Bell 30

Departure of Dr. Grenfell 30

Excursion to Little ?arrows 31

News from Petewawa, a letter from McCurdy 31-32

List of Experiments July 23 to July 30 33-35

Water water everywhere and not a drop to drink 34-40

Drinking water obtained from fog 34

Drinking water obtained from the breath 35

Amount of water obtained from breath 36

Apparatus used, with photos of same 37

Some objections to the use of Vertical Surfaces 41–46

No vertical surfaces in a bird 42

Effects of side winds upon verticals 43

Side-drift produced 43

Turning and upsetting movements 44

Other disadvantages of vertical surfaces 45

Advantages of vertical surfaces 45

Progress of aviation eliminates them 46

Concluding remarks 46

The last flight of the Silver-Dart, a telegram from Baldwin 47–47

The accident at Petewawa 47–47

The great event of July at Beinn Bhreagh 48–50

Photo of yacht “J A McCoch” 51–51

Photo of Steam yacht “Enchantress” 52–52

Photos of model of Cygnet II 53–53

Date obtained July with model of Cygnet II 54–54

Photos of upside-down Oiones kite 55–55

Data obtained July with upside-down Oiones kite 56–56

Photo of childrens' Birthday party 57–57

Photo of Dr. Grenfell and Dr. Bell 5?–5?

Photo of examination of sheep 58–58

Photo of a corner in flower garden 59–59

The “Silver-Dart” at Petewawa 60–63

Beinn Bhreagh Items July 26–Aug.6 64–75

Birthday Party 64

Distribution of sheep among farmers 65

Dr. Grenfell's dog-sledge 66

Davidson pays big prices for sheep 67

Davidson cross over meter experts 69

Accident to Maggie Campbell 70

American visitors at Nursery 70

Sheep for Harrison, McDonald and Macrae 71

Arrival of Mrs. Edwin A. Grosvenor 72

Notice to Beinn Bhreagh employees 72

The Baddeck races 73

More American visitors at Nursery 73

Our nick list 74

Laboratory Notes 75-76

Electric safety switch 76-77

The work of the Farm Department 77-78

Four-horned sheep for farm department 78-80

Work of the Department of Buildings and 81-86

Recent work of the Department 81

A glass-bottomed House-boat 82

Sanitary disposal of sewage matter 83

Baldwin's account of the Silver-Dart flights 87-90

Efficiency verous Stability 91-93

Pin-pricks at Petewawa 94-94

Remedy for sympathetic vibration 94-97

Extracts from Baldwin's letter of Aug. 4, 6 & 7 98-99

Cartoon about Silver-Dart disaster 100-100

Photos of Sandy and Lilian 101-102

Latham's attempt to fly across British Channel July 19 103-104

The drome that carried across British Channel 105-105

Baddeck No.I takes the air 106-107

Report of Beinn Bhreagh Nursery 107-111

The flower garden at Beinn Bhreagh Hall 111-116

Second flight of Baddeck No.I 117-118

Laboratory Notes 118-119

Note from Aerodrome Company 119-120

Beinn Bhreagh Items Aug. 7-14 120-125

Acetylene lights at the Point 120

A closed carriage for Beinn Bhreagh 121

Visitors at BB Nursery 121

The motor boat races 121

Too late 121

McInnis' sheep run away 121

The Capt. of Gauldrie knows how to swim 122

Visitors at Laboratory 122

The steam-tug "Alexandra" 122

Filled up with water & a drop too much 123

Mrs. Bennett at Beinn Bhreagh 123

The contributions of XYZ 123

Laboratory Challenge accepted 123

List of experiments Aug. 7-14 125-125

The cause of the accident to Baddeck No.I 126-130

Editorials and Articles:—

Kite Data Aug.11–14 131–132

Anemometer Rules 133–133

Beinn Bhreagh Nursery:—

Multi-nippled Sheep at BB Nursery Aug.17 134–134

Ancestry of the Multi-nippled Rams 135–141

Ancestry of the Multi-nippled 142–148

Remarks concerning the Sheep Tables 149–153

Beinn Bhreagh Laboratory:—

The Oionas Aerodrome 154–154

The Cygnet II 154–154

Model of Cygnet II 154–154

Model of Oionas Aerodrome 154–159

The Canadian Aerodrome Company:—

The Baddeck No.2 159–159

Petewawa photographs of Baddeck No.1 159–162

Farm Department:—

Damage to Beinn Bhreagh Roads 163–164

News of the E?la Sheep 164–164

Department of Buildings and :—

Damage to Crescent Grove Boat-house 165-165

The Glass-bottomed House-boat 165-165

List of Experiment Aug.15-21:—

Model of Cygnet II Aug.19 165-165

Beinn Bhreagh Items: Aug.1?—21:—

Visitors at BB Nursery Aug.16 166-166

Malcolm McFarlane goes to Sydney 167-167

Visitors at BB Laboratory Aug.16 167-167

A Chest soon on Beinn Bhreagh 168-168

An Ant Story 169-169

Return of Baldwin and McCurdy 169-169

Rain Storm of Aug.18-19 170-170

Alexander Fairchild's Birthday Party 170-170

Visitors at BB Laboratory Aug.20 171-171

A Testing ground for Aerodromes 171-171

The Contributions of XYZ:—

Explanation of the 172-173

The Spirit of Flight 173-174

G. Editorials and Articles. 17?-?11

Some facts concerning the aerodrome Co and its work: by J.A.D. McCurdy 175

Study of Ancestry of Multi-nippled sheep By A.C. Bell 179

Ancestry of 170

Ancestry of Ewes 171

Blood Values of 183

Blood Values of Ewes 189

Summary of Blood Values 195

Sheep in order of Blood 197

General Remarks 198

A Trip to : By J.G. Davidson 202

Illustrations of effects of rain storm on BB: By Gilbert H. Grosvenor 206

Motor Sledge for Dr. Grenfell: A letter from Dr. Grenfell with photo 210

Beinn Bhreagh Laboratory 212-214

Details concerning model 212

A correction 214

Steamer Blue Hill to tow Cygnet II 214

Canadian Aerodrome Company 215-218

Preventing wires breaking from vibration 215

Searching for testing ground for drums 215

Suitable testing ground found 216

Beinn Bhreagh Nursery 219-220

Alfalfa Experiments 219

Beinn Bhreagh Farm Department. 220-222

Zulu Sheep arrive in Halifax 221

Department of Buildings and Whar?es 222-222

List of Experiments Aug.22-2? 223-223

Beinn Bhreagh Items Aug.22-28 223-227

Aerodrome Co beats the Lab 223

Concert at BB Hall 224

Visitors at BB Lab 225

A fine exhibition of seamanship 226

Another Chest on Beinn Bhreagh 227

Editorials and Articles 22?-241

The radiator of Baddeck No.I 228

The curved bow-central of Baddeck No. I 235

Vertical steering 23?

Horizontal steering 239

The Canadian Aerodrome Company 241-242

Progress of Baddeck No.II 241

The return of Baddeck No.I 242

Beinn Bhreagh Farm Department. 243-266

Crops 242

Roads 243

Zulu Sheep 244

Saving Land at 245

Live stock on 245

Department of Building & Wharves 248-249

The saw-mill 246

The Ugly Duckling House-boat 248

The Tetrahedral Tower 248

Acetylene C?s-Plant 248

The Gauldrie 249

Beinn Bhreagh Nursery: 250-25?

Damage to fruit 250

?ata 250

General work of BB Nur?sery 250

Multi-nippled sheep 251

Look out for ram 17A 251

Weights of multi-nippled sheep, So t.1 252

Photographs of flowers 253

Beinn Bhreagh Laboratory 254-264

New kite pole 254

Up side-down kite. (pure tetrahedral) 255

Model of Oionos dro?e 256

Cygnets II 258

Model of Cygnets II 258

Kite data July 26–Sept. 1 259

List of experiments Aug.29–Sept.7 260

Beinn Bhreagh Items, Aug.29–Sept.7 266–272

Acetylene Lights give out 263

Hutchinson's Acousticon 266

Visitors at BB Nursery 267

The Swo?m wins the handicap 268

Pe?ry gains the North Pole 268

Very like a whale 270

A new c?ntortionist on Beinn Bhreagh 270

Light upon the Light on the Tower 271

Editorials and Articles 273–287

Study of kite data secured July 26–Sept.1 273

Some random thoughts about Front Controls 274

Oblique lateral ra?ders 275

Paper wings for aerodromes 276

Sheep Statistics for twenty years 278

Table I Color 271

Table II Sex 282

Table III Fertility 283

Table IV 284

Table V continued 285

Table VI continued 286

Kite data Sept.7-13 287

Beinn Bhreagh Nursery 288-294

More cats 288

Angora Goats 288

General work Sept.5-11 291

Visitors at BB Nursery 291

Sheep Distribution 292

Photographs of cut flowers 293

Department of Buildings & Wharves 295-296

Crescent Grove Boat-house 255

Superintendent's Office 295

Glass-bottomed house-boat 295

Gauldrie leaves with Baddeck No.II 295

Bungalow at Crescent Grove 296

Beinn Bhreagh Lodge 296

McKenzie returns with a wife 296

New House-boat goes to Baddeck River 296

Beinn Bhreagh Laboratory 297-298

Malcolm McFarlane 297

Repairs to Gauldrie 297

model 297

Photographs of wing piece of Oiones model 298

Canadian Aerodrome Company 299-302

The Aero shed at Big Baddeck 299

Completion of Baddeck No.II 300

Baddeck No.II leaves Beinn Bhreagh 301

Photograph of departure of Baddeck No.II 302

Beinn Bhreagh Farm Department 303-304

The Zulu Sheep 303

Beinn Bhreagh Items Sept.8-1? 304-306

Second game 305

Arrival of Mr. Gardiner Hubbard 305

Wild Geese at Beinn Bhreagh 306

A Military Hall in town 306

A contribution by XYZ 306

Beinn Bhreagh Farm Department 307-309

The Zulu Sheep arrive 307

Importing Stock into Canada 307

Ram Admiral Anson 309

Beinn Bhreagh Nursery 310-311

Letter to Farmers about Sheep 310

Work of Nursery for week ending Sept 18 310

Many Potato Bugs 311

Department of Buildings and Wharves 312-313

Winter Coal for Beinn Bhreagh 312

Mrs. Frost's Cottage 312

Saw-Mill 312

Contract for wiring HB Hall awarded 312

Acetylene Plant 312

Acetylene Plant 313

Beinn Bhreagh Items 314-315

Visitors at Beinn Bhreagh Hall 314

Can Drury arrives in Baddeck 314

Can Drury visits BB 314

Miss Winifred Darling 315

Fine display of Aurora bor?alis 315

Beinn Bhreagh Laboratory 316-320

Water propeller for Query 316

Work on Oiones Model 316

Repairs on Annex 316

Ross, Machinist, returns 316

Photographing Nipples of Sheep 317

Experiments with Query 317

Oiones Model 318

Overhauling eight cylinder engine 318

Bedwin's sketch of tail attachment, Oiones 319

Hydro-surfaces on Query, Sept 18 (upper) 320

Hydro-surfaces on Query, Sept 18 (lower) 320

Canadian Aerodrome Company 321-324

Movements of Baldwin and McCurdy Sept 16-18 321

Gen. Drury visits testing ground 321

Mrs. Bell and party visits testing ground 322

Mrs. Baldwin ?ts as reporter for Recorder 322

Ingraham visits Beinn Bhreagh factory 322

Ingraham's notes Sept 19 322

Arrival of House-boat at Big Baddeck 323

Experiments with Baddeck No II 324

Editorials and Articles 325–337

Editorials and Articles 325–337

Suggestions concerning tail of Baddeck II 325

Sheep Statistics for 1890–1909 (continued) 327

Table VII: Ages of mothers 327

Table VIII: Ages of mothers of Twins 328

Table IX: Fertility & age of mother 329

Table X: Month of birth 330

Table XI: Month of birth of Twins 331

Table XII: Fertility & month of birth 332

Photos of nipples of 1505, 1606, 1706, 1734 333

Photos of nipples of 173, 1805, 18A 334

Aviation Week at 335

Photo of Curtiss' Aerodrome 337

Beinn Bhreagh Farm Department 337–338

Harvesting on Farm 338

Need of more Barn Room 33?

Beinn Bhreagh Nursery 330–340

Flowers cut on Beinn Bhreagh 339

Flower display at Baddeck 339

Nursery work week ending Sept 26 340

Visitors at Beinn Bhreagh Nursery 340

Davidson leaves for Halifax Exhibition 340

Department of Buildings and Wharves 341–342

?am-Hill 341

Gauldrie takes many passengers 341

Mrs. Frost's cottage 341

Visit to Truro 341

Visitors at Central Wharf 342

Beinn Bhreagh Laboratory 343–347

Oiones model 343

Query 343

Experiments with Cygnet II model 343

Data on Oiones model 343

Oiones Tail 344

Photo of none attachment to Oiones Drome 345

Photo of Oiones Drome showing tail (upper) 346

Photo of Oiones Drome showing tail (lower) 346

Side-view of Oiones showing tail & nose 347

Front view of Oiones showing nose elevated 347

Beinn Bhreagh Items 348-34?

Gilbert H. Grosvenor leaves BB 348

Sandy and Barbara Fairchild leave BB 348

Anniversary celebrated by Mr. & Mrs. Kennan 348

Mrs. Bell meets Miss Caroline McCurdy 348

Horse Mackerel seen in ?ay 34?

Dr. Bell visits Bentick Farm 349

Canadian Aerodrome Company 350-3?2

Movements of McCurdy & Baldwin Sept 20-2? 350

Letter from McCurdy to Bell 350

Diary kept by Mrs. Baldwin at Bentick Farm 351

Flights with Baddeck No.II 362

Editorials and Articles 353-357

Sheep Statistics for 1 90-1909(continued) 353

Table XIII: Fertility to Color 353

Table XIV: Fertility to Sex 354

Table XV: Fertility to No of nipple 355

Table XVI: Fert. to Fert. in 356

Table XVII: Detailed Table Sheep 357

Sheep Statistics for 1890–1909 (Continued) 358–366

List of Lambs born on BB 1904–1909 358–364

Lambs born on BB 1904 356

Lambs born on BB 1905 360

Lambs born on BB 1906 361

Lambs born on BB 1907 362

Lambs born on BB 1908 363

Lambs born on BB 1909 364

Sheep Catalogue 1904–1908 365–366

Errata in printed catalogue 1904 365

Explanations of contractions 365

Department of Buildings & Wharves 367–367

Reservoir 367

Fencing at Crescent Grove 367

Mrs. Frost's Cottage 367

Crematory 367

Plans for Sheep Shed 367

Beinn Bhreagh Farm Department 368–370

Work week ending Oct 2 368

Examination of Zulu Sheep 368

Three year old colt weighs 1250 368

Photo of Zulu Rams 369

Photo of Zulu 370

Beinn Bhreagh Nursery 371–374

Trip to Halifax Exhibition 371–374

A trip in the Gauldrie 371

Visit to Provincial Farm 372

Visit to Halifax Public Garden 373

At the Halifax Exhibition 373

Work at Nursery for week ending Oct 2 374–374

Visitors at BB Nursery 374

Beinn Bhreagh Laboratory 375–383

Work and Experiments at BB Laboratory 375–380

Full size Oiones model 375

Oiones model 375

Experiments with Query (Oct1) 376

Weight of Oiones model 376

Oiones model on Bay (Oct 2) 376

Experiments with Query (Oct 5) 377

Oiones model on Bay (Oct 7) 377

Exps. with model of Cygnet II 378

Kite Data, Sept 23–Oct 5 380

Photos of Laboratory work 381–383

Oiones Drome showing new bow 381

Oiones on deck of “Get-Away” 382

Oionos model in the air 362

Oiones model tipped on one side 383

Oiones model in the air 368

Oiones model falling into water 383

Canadian Aerodrome Company 384–396

Work at the BB Factory 384

Flights with Baddeck No 2 384

Dr. Bell's trip to testing ground 385

Baddeck 2 leaves ground Sept 29 385

First flight Sept 30 385

Second flight Sept 30 386

Third flight Sept 30 387

Cause of accident by A G Bell 388

A lever simile 389

The slip-wind of the propeller 390

Cause of accident by J A D McCurdy 391

Cause of accident by F W Baldwin 391

Dr. Bell further discusses accident 392

Don't shut off power in making turn 393

Rear surfaces to propeller thrust 393

Photo of Baddeck No 2, Big Baddeck 394

Photo of Baddeck No 2, Big Baddeck 395

Photo Baddeck No 2 bad landing(Sept 30 396

Editorials and Articles 397-417

Vacuum Balloons by A G Bell 397

Ideas concerning balloons by Hubbard 398

A E A's ideas adopted by others 399

Photo of Farman's 11? mile flight 400

Photo of Latham's Antoinette 401

The Church of England Pageant by Mrs. A G Bell. (A paper presented to the Ladies' Club of Baddeck, Oct 7, 1909) 402

Arrival at Fulham Palace 404

The Pageant 405

A bloodless victory 406

The conversion of the Plots 408

Enforced Celibacy of the Priests 409

Magna Charts 411

End of afternoon performance 412

The evening performance 412

The closing scene 413

Impressions left by the Pageant 414

The Pageant as means of education 414

Pageant re history of Cape Breton 417

Leg of cruise in "Scrapper" 418

Beinn Bhreagh Items 419–421

An old relic 419

Gardiner Hubbard leaves BB 419

School Children visit BB 420

List of names at BB Hall Sept 27 420

Kite Data Oct 7 (model of Cygnet II) 422

Query Experiments Oct 5–6 (with and without planes 423

Query Experiments Oct 8 (with and without planes) 424

Query Experiments Oct 9 (with and without planes) 425

Query Experiments Oct 11 (with and without planes) 426

Query Experiments Oct 11 (with and without planes) 427

Query Experiments Oct 5–11 (summary table) 428

Query Experiments Oct 5–11 (averages) 429

Query Experiments Oct 5–11 (sum & Aver by grouped speeds) 430

Kite Data July 2?–Oct 7 (with model of Cygnet II) 431

Kite Data July 26–Oct 7 (Cygnet II, General Averages) 432

End of Volume I.